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GROWTH and DEVELOPMENT
of the
YOUNG CHILD

— WINIFRED RAND —
— MARY E. SWEENEY —
— E. LEE VINCENT —

FOURTH EDITION

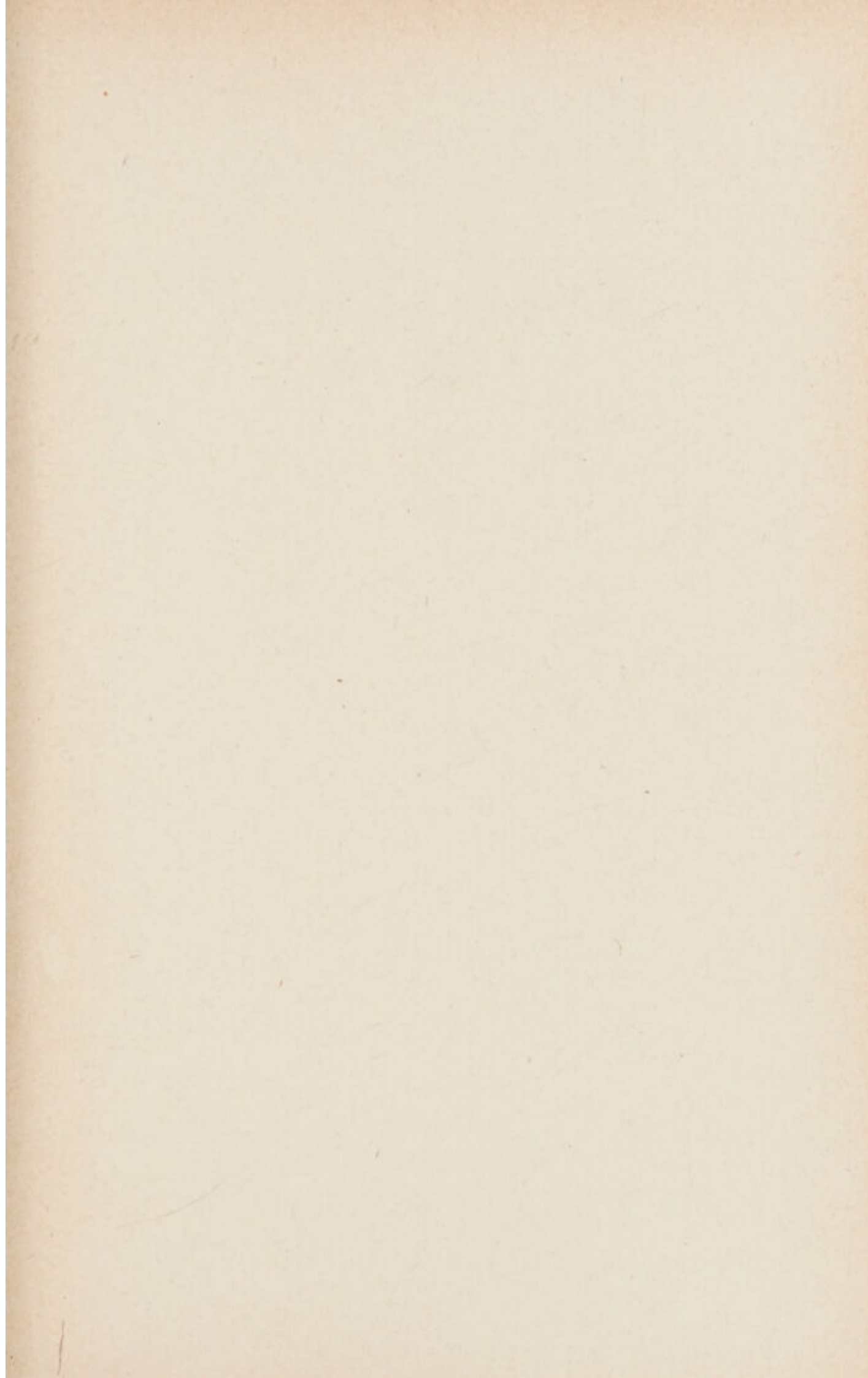


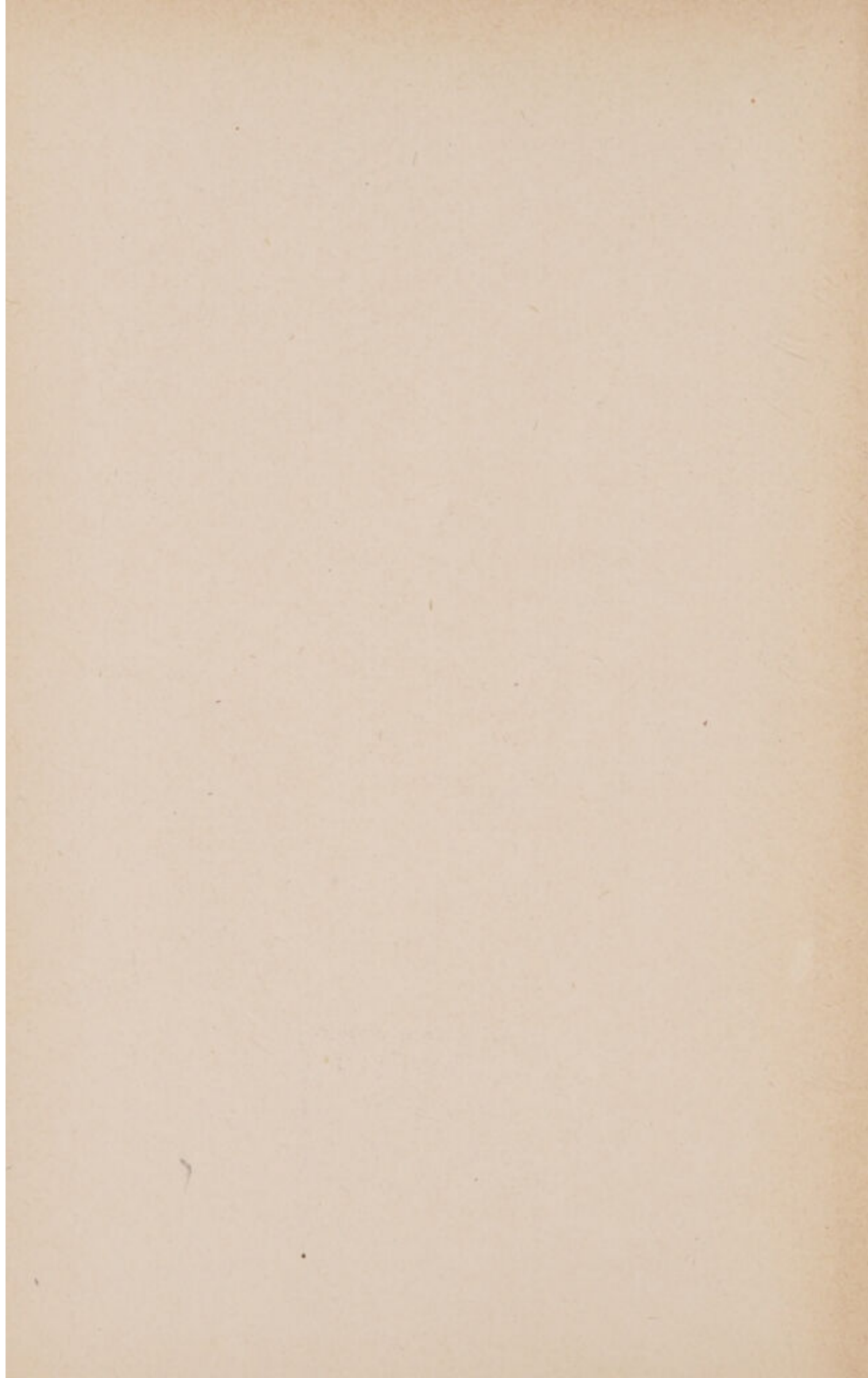
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Growth & Development of the Young Child

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Fourth Edition, Illustrated



W. B. SAUNDERS COMPANY

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Preface to the Fourth Edition

In few fields of teaching have as many advances been made in the past twenty years as in the field of child development. These advances have occurred in the basic research, in the content of subject matter, in teaching methods and in the general viewpoint. When this book first appeared fifteen years ago, the child development movement was comparatively new. Medicine, Nutrition, Psychology and Education were opening their own avenues of investigation of child growth and development. There was little appreciation of the interrelatedness of the various aspects of growth. Writers in the field, particularly in the area of practical application, tended to regard research findings as ultimate, with the result that principles of child development were pronounced in a dogmatic manner. Parents tended to follow these principles literally. Scales and standards as they were published were applied rigorously to individual children, who were judged to be growing well or poorly by their relationship to these figures. Adherence to rigid daily schedules for infants and young children was thought to be required for good growth. Concerted campaigns upon behavior problems were launched and tended to follow rigid prescriptions. Early independence from the mother and the early achievement of self-care were encouraged.

Within the past five years, the viewpoint has been shifting. Medicine, Nutrition, Physiology, Psychology, Sociology and Education are coordinating their findings. Intricately interrelated patterns of growth are beginning to emerge. Understanding of the deep physiological and psychological needs of children is modifying the dogmatic tone of old precepts and is tempering the rigidity of application. Among these needs is the child's need to grow at his own natural maturational pace. Awareness of this and long-time analyses of individual children's continuous growth records are leading specialists to minimize the use of age-scales and to adopt the concept of maturity stages in studies of growth.

The indirect methods of play therapy are replacing the old direct campaigns of discipline in dealing with behavior problems. Self-demand schedules are beginning to replace the old schedules once prescribed indiscriminately for all children. The guarding of emotional security is more prominent in up-to-date practice than the forcing of early independence. Profound changes have occurred in basic concepts of nutrition, a field in which great advances have been made.

We have attempted to alter the content of this book to include these changes in concept and practice in the child development field. The book has, in fact, been almost entirely rewritten. The rewriting has involved a new organization for a more logical and a better integrated discussion of the various phases of child growth.

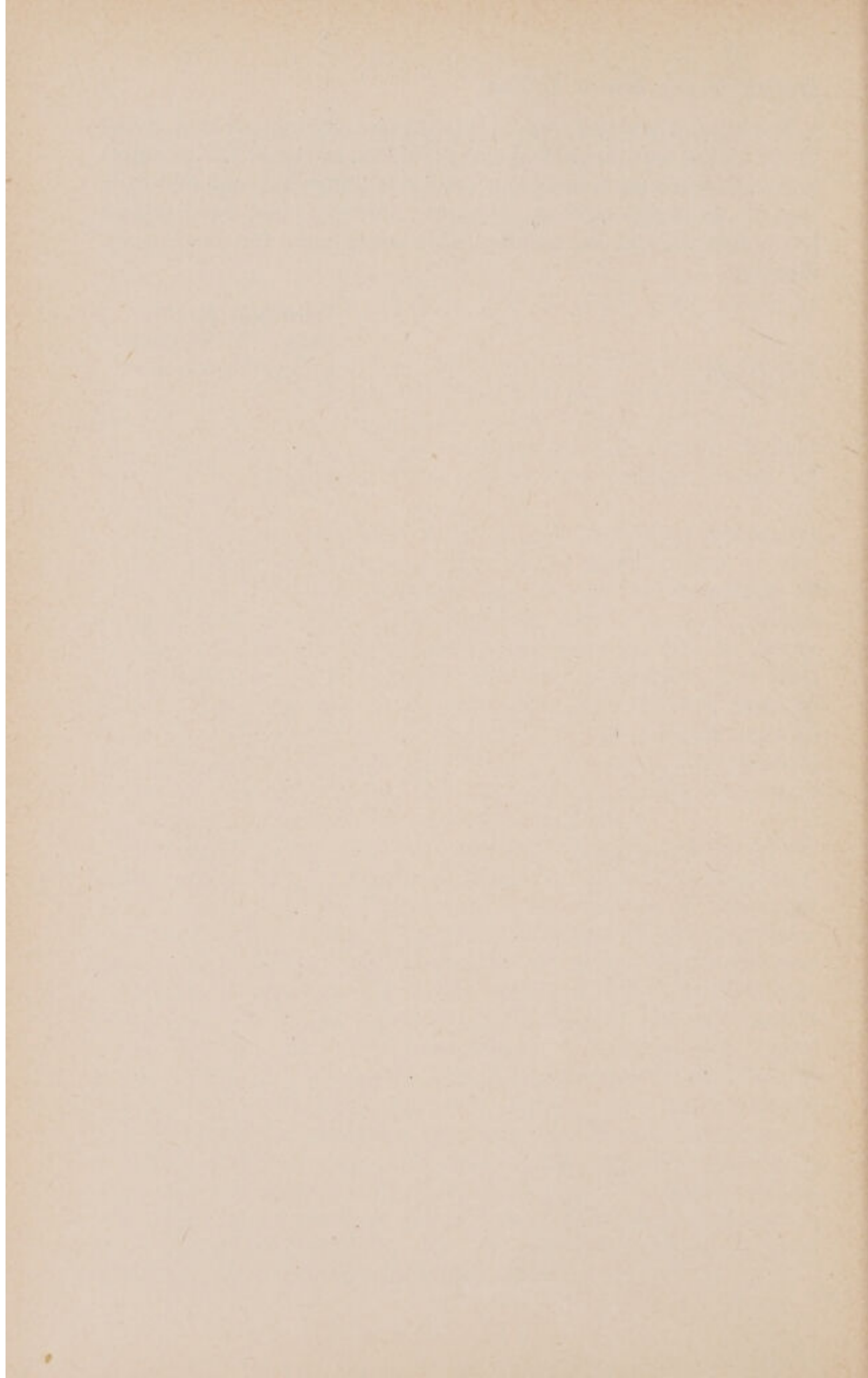
Of even more importance is the greatly expanded discussion of the intellectual, emotional and social development of the young child, an expansion which has brought these aspects in better perspective with physical growth. The various phases of learning are fully covered as well as guidance in the unfolding of the child's emotions and behavior. Careful attention has been given to the elements in the child's background—the kind of home most conducive to his best development and the outside influence which will play upon his social growth. The residual impact of the war on the child through his family and social environment is indicated in appropriate places.

Miss Idell Pyle has been instrumental in helping us to learn the current thinking and practice in several of the outstanding child development research laboratories in the country. Without her time and patience many of the changes in viewpoint and presentation in this edition would not have come about. Miss Genevieve Trainham, director of the infant service at the Merrill-Palmer School, has been most helpful with the material and case studies which concern infant care. Miss Marian E. Breckenridge, chairman of the physical growth department of the Merrill-Palmer School, has given unsparingly of her time. Several parents of the Merrill-Palmer infant service and nursery school are responsible for the photographs, many of which could have been taken only by someone who lives with children. Dr. and Mrs. Russell Smart both read parts of the book and gave their criticisms of the material from the teaching point of view. We are most grateful to these people for their help and their inspiration.

Twenty-five years of records on the same children are now giving us the test of our theories as these children adjust or fail to adjust to life. Perhaps the tone of this edition is somewhat modified from that of our earlier editions. If so, the study of child development has taught us, and our children have contributed the most to our thinking.

July, 1946

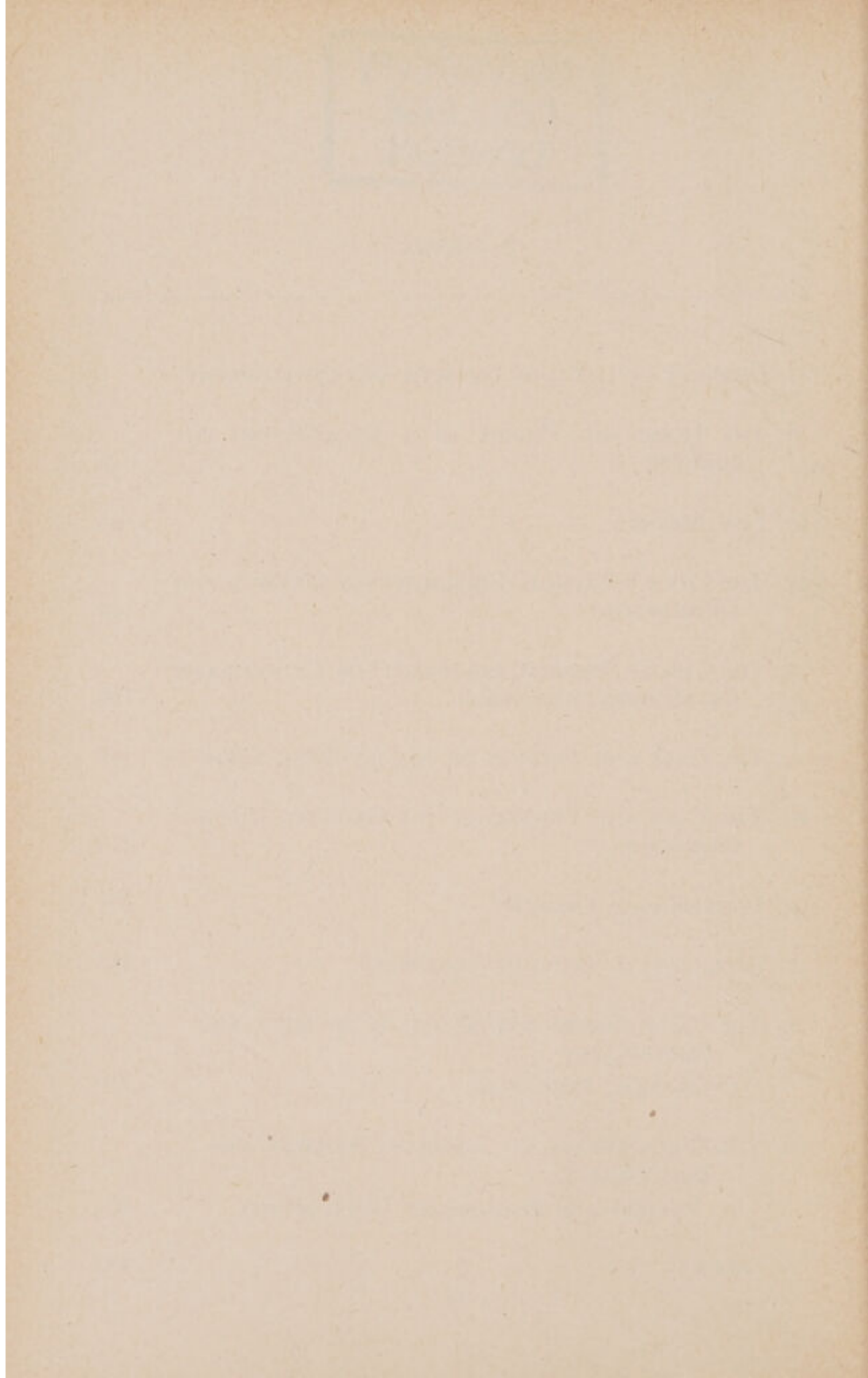
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Current Concepts of Growth and Development

One of the ways in which our ideas of child development have changed most in the past ten years is in our understanding of how widely the pace of growth differs in children who are to be regarded as normal. There are slow growers, fast growers and average growers. Many slow growers prove to be feeble-minded or dwarfs, and some fast growers prove to be giants or to possess lop-sided intellects or personalities. But many slow growers and many fast growers turn out to be normal, well-adjusted people. In recent years we have been discovering that normal children arrive at the various stages of growth physically, intellectually or socially at different rates. For example, upright locomotion, or walking, is a step along the way to ultimate complete maturity in motor control. Some normal children arrive at this step at eight months of chronological age, some at twelve months and some at sixteen months.

Another change in our ideas has come in our conception of the rapidity with which young children should be forced to become independent of adults in such matters as weaning from the breast, toilet training, self-care and the like. The child's deep need to be protected in his babyhood and to be allowed to "live out" his infancy has been recognized. His maturation through babyhood and into childhood does not occur as quickly as was previously thought.

Understanding of the importance of inner structural and functional maturing as prerequisite to learning or adjustment of any sort has become increasingly clear. The old, so-called "habit training" attitude has changed. Birthday-age no longer dictates the time to begin "training" programs. The appearance of certain maturity stages now dictate the time for the beginning of new learnings.

The Shift from Age-Scales to Maturity Scales.—One of the important shifts in viewpoint in the past ten years is from our

previous dependence upon age-scale standards (such as height-age, mental-age and social-age) to other means of charting growth. The age-scales have been extremely valuable in giving us knowledge of general principles of growth, but when applied too rigorously to individual children, they have led to misunderstandings about the growth of children.

Eventually, age-scales will probably be replaced by maturity scales which will be based on long time studies of the same children through their entire growth span. The steps of such scales will be steps or stages of growth and will be entirely independent of birthday age. For example, we shall abandon our present attempts to set up social-age scales by studying typical social behavior of large groups of each chronological age group. In all probability we shall, in the future, continue and expand present efforts to study the pattern of development of social behavior in a number of individual children as they grow through the range of social behavior from infantile self-absorption to the more mature stages of true social cooperation. From these studies we are already discovering a social maturity scale, in which the steps or stages of the scale represent successive points in the social growth of the child. Thus, instead of comparing a three-year-old child with other three-year-olds, we shall study his present pattern of social behavior, review it in relation to his past pattern, and from this determine at what stage of his total social development he is.

An example of this is a child, who, upon entering kindergarten, stands around and does not adapt to the other children in cooperative play. If we measure him against a social-age scale, judging him only by an observation of his present behavior and a checking of his behavior against a social-age scale, we might conclude that this behavior represents a two-year-old type of inability to adapt to a cooperative situation. The social-age would be two years, and the "social quotient" of such a child would be 40, or two-fifths of five years. A child with a social developmental quotient of 40 will probably be regarded as a social moron. The assumption is sometimes made that since his social-age is two when he is five years old, he will thereafter develop at only two-fifths of the average rate, and when he is twenty years old, his social-age will be eight years.

On the other hand, if we look at this child from the viewpoint of his present stage of social growth, which can be interpreted only in terms of his previous social development and of the factors

which have made him what he is, we may see him in a different light. He may come from a pair of well-adjusted, but socially quiet and nonaggressive parents. He may have shown quite adequate early social adjustments to his parents and to the familiar children in the neighborhood, and at the same time been somewhat reticent when in a larger group of children or when faced with strange children. Given a little time, he may make satisfactory social adjustment to other children on a desirably cooperative basis. In this light, we see this child as quite normally adjusted for a quiet, nonaggressive type of personality. His social adjustment is passing through a stage, or a maturity level, which is quite satisfactory for his age and social experience. The ultimate, fully mature (or 100 per cent maturity) level for this child will be an adequate social adjustment of the type his parents are making. We see him now as a child who will take a little time to affect a smooth adjustment to the larger group which he faces upon entrance to the kindergarten, and as a child who, for him, is adjusting satisfactorily. By this standard, he is not a social moron. He is a five-year-old who has made satisfactory progressive steps in social growth of the quiet, nonaggressive, but adequate pattern. His channel of social-growth is that of the nonaggressive personality. The more average aggressive personality and the highly aggressive personality grow through somewhat different sets of social behavior steps.

The Concept of Growth Channels.—Thus we see social growth traveling in certain channels, the successive steps or maturity stages of each channel having their own characteristics. In this concept a child is measured by his progress along his own channel of growth, rather than against an age-scale based upon pooled observations of all children of any given age.

The channel idea is clearly demonstrated by the Wetzel Grid, a device for evaluating children's growth in height and weight.*

*Wetzel, Norman.^{393, 394, 395} Bruch, H. ^{56a} The procedure for the Wetzel Grid demands only three measurements: height, weight and chronological age. The significance of the method lies in construction of the grid, a device for automatically locating a given child's natural channel of physical development. Height and weight can be recorded in terms of a single point, which falls into one of the channels on the grid, thereby describing his physique and developmental level simultaneously. Subsequent measurements can be plotted, and from these the direction of the child's progress can be studied. If his progress follows along in the channel which is thus established for him, it may be concluded that he is growing satisfactorily for him.

"What the channel course primarily displays, therefore, is direction [of growth], and as a result of maintaining a given direction, whether physique is

Children of average body type progress in height and weight gains along the middle channel of the grid. Children who tend to be the stocky type proceed in the left-hand channel; children of the slender type proceed along the right-hand channel. If any given child's growth in height and weight is satisfactory for him, he proceeds along his own channel. In plotting his height and weight for any given measurement, his progress within the confines of a given channel or his swing toward the right or left indicates whether he is proceeding at a desirable rate or gaining too rapidly or too slowly for him. Like accumulative records, this affords an opportunity to compare the child with his own growth pattern. For another example of growth along channels see Figure 44, Chapter VIII.

Single measurements cannot give the help in judging a child's well-being that can be had from a series of accumulative measurements. Even in using age-scales, accumulative records give some help in judging a child's progress. Much greater help is given, however, when the whole series of measurements is oriented to the individual child's maturity pattern, as in the Wetzel channels.

The Concept of Percentage of Terminal Status.—Another method of expressing the growth accomplished by any given child at any given stage of development is in terms of percentage of terminal status (or mature development) he has achieved at the time the measurement is made. This is a method being developed at the present time by workers in several centers in the child development field.^{29, 253, 328} By this method, terminal status, or the ultimate mature level of growth in any given growth area, is considered as 100 per cent. Any step on the way to this terminal status can be expressed in terms of the percentage of the total growth distance the child has traversed at the moment of measurement. The 100 per cent is the point at which the individual becomes mature in the function under consideration, regardless of the length of time it took him to reach that maturity. For example, in a study of eye fixation in infants Morgan²⁵³ found that certain types of eye fixation reached 100 per cent maturity within the first

being altered or whether it remains the same as development proceeds. Thus, a child in any channel, depending only on causes within himself or within his environment, will proceed right, left or forward on dead center, with the corresponding result of loss, gain or no change in physique, respectively." Wetzel³⁹⁴ (p. 544).

ten days of life (Fig. 1). In this particular area of growth, then, the child is mature at the age of ten days.

Among 999 children studied at the Brush Foundation in Cleveland, Ohio, terminal status in stature (or adult stature) was achieved in boys as early as fifteen years and as late as twenty years; in girls, as early as fourteen years and as late as eighteen

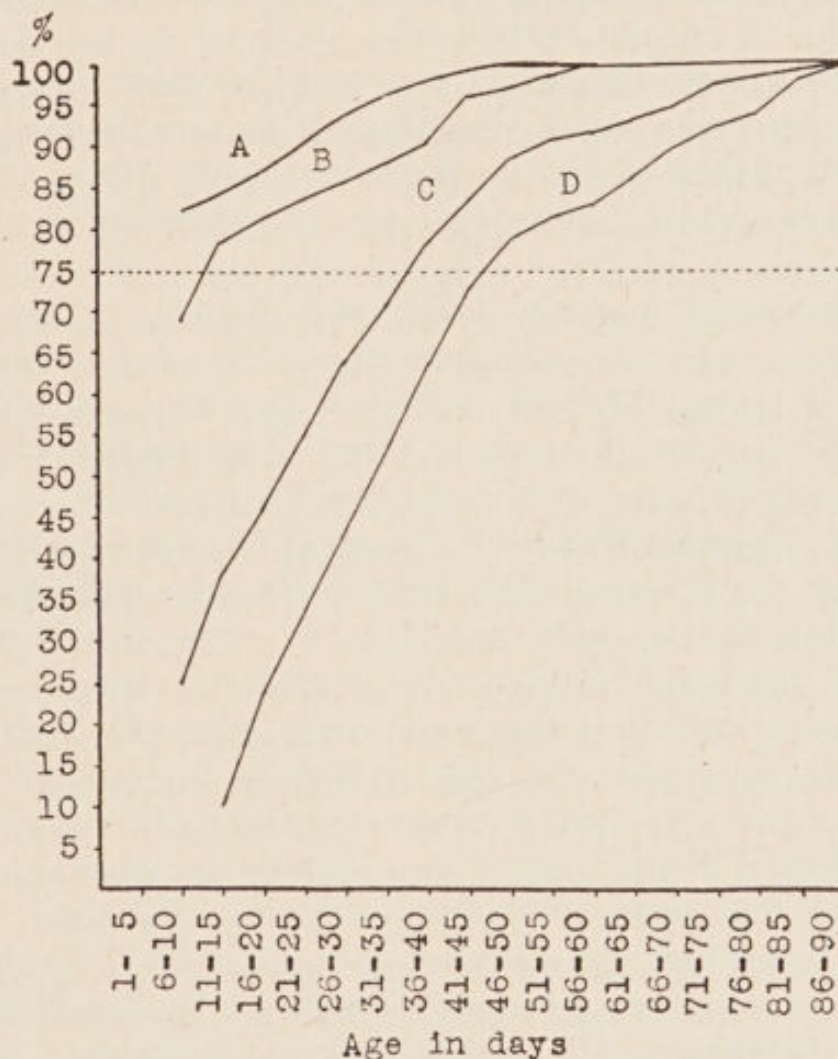


Fig. 1.—Fixation and horizontal following. A, Fixation curve indicates that infants passed 75 per cent criterion mark in less than ten days of life. B, Horizontal following a short distance. C, Horizontal following all the way and reverse. D, Continuous horizontal following. (Morgan and Morgan: *The Journal of Pediatrics*, Vol. 25, C. V. Mosby Co.)

years. Most children have proceeded 90 per cent of the distance to adult stature at puberty.³²⁸ Regardless of the individual differences in actual height and weight, children differ widely in the per cent of mature bone development or adult stature achieved at any given age. Some children have come most of the distance toward skeletal maturing at eleven years of age, whereas other children

have gone the same distance only when they are sixteen years old.²⁹ A girl, for example, who achieves biological sexual maturity at eleven years has arrived at 100 per cent of maturity in this area at that age; if studied at nine years of age, she probably would have achieved 90 per cent of the maturing in this function. Another girl at nine may have achieved only 60 per cent of her maturing in this area, because her 100 per cent level will not be achieved until sixteen years of chronological age.

There are certain indicators now being worked out which will help us to determine what percentage of mature development has been accomplished at certain indicator levels. When these indicators appear, we shall know that a given per cent of maturing has occurred.

The concept of maturity levels and maturity scales may, of course, take some other form than those discussed in this chapter. We may be reasonably sure, however, that the idea of maturity levels as a basis for grouping children to be studied will in time replace concepts based on chronological age levels.

The Old, "Normal Weather" Theory of Growth Standards.—Let us consider the practical difference in dealing with children between following age-scale standards or some other evaluation devices. In the earlier days of the child development movement, children were studied in the mass. Measurements, both physical and mental, were taken on large groups of two-year-olds, three-year-olds or five-year-olds. Averages were then taken, and "growth curves" plotted. From these growth curves one could supposedly tell whether any given child was maturing as he should, the assumption being that the averages of thousands of children must surely tell us what any given child ought to be like. If he was as tall as, or as smart as the average, all was considered well. If he was taller than or smarter than the average, everyone rejoiced and felt sure of his success in life. If, on the other hand, he was shorter than or had fewer words in his vocabulary than the average child of his age, he was "retarded." This is like measuring the weather over a period of winter seasons and setting up a "normal" weather for the given season. Days that were above normal would be considered superior, and those below normal would be considered inferior.

Similarly with children, there are certain aspects of being below average for age which should cause us concern, and there are also certain aspects of being above average, or early in achieving

mastery over a certain learning, which should be cause for rejoicing. But as a result of our long-time studies and of our newer concepts in child development, we now know that children may be slow in development of some trait when compared with the average and yet turn out to be normal, whereas some children who are developing in some trait at a rate faster than average may prove later to have achieved this rapid development at the cost of some other line of development.

Slow Growth Not Necessarily Undesirable.—Some children do not walk until seventeen or eighteen months and yet eventually become normal in general motor control. For these children slow growth does not indicate that they will never achieve normal motor skills. There are other children, of course, whose slowness in walking is an indication that motor skills will always be deficient. If possible, slow developers in any trait should be checked by specialists who can judge whether the slowness is one which a change in environment will help, or one which is inherent in the child's growth pattern, and which he will either outgrow or which must be accepted as unchangeable. In any case, attempts at forcing will do no good. There is no cause for worry about the development of the slow walker if he ultimately learns to walk with good skill and if he takes each successive step toward this skill at the time in *his* growth when other maturities and other learnings make him ready for each step as it occurs. This should be a satisfactory pace for him. How he compares with the average of 5000 other children is, then, of no concern. Our newer understanding of maturity stages will help us to evaluate slow growth properly.

Fast Growth Not Necessarily Desirable.—Conversely, many child development experts are finding that there is no particular virtue in many forms of fast growth. There are, in fact, many evidences that early accomplishment of a given growth stage may be advantageous only under certain circumstances. In some instances, early accomplishment of some growth stages proves a serious disadvantage. For example, there is no cause for rejoicing at early toilet reliability if that reliability has been forced upon the child before his general maturity has reached the point where the toilet habits to which he is being introduced come easily and naturally to him. Our follow-up on the same children through many years has given us repeated cases of children, trained for the toilet by ten months or a year, who later suffered serious toilet "relapses" which were directly traceable to deep-rooted emotional

disturbances arising from too early forcing of toilet responsibility. Serious damage is done to any child whose learnings are forced beyond his natural readiness. As an illustration of this principle, we have no evidence that children who grow in height faster than the average child have any more physical stamina or are physically or socially more adequate than are children who acquire height at a rate indicated by an average age-scale standard. They may, in fact, suffer some disadvantage because of their rapid growth.

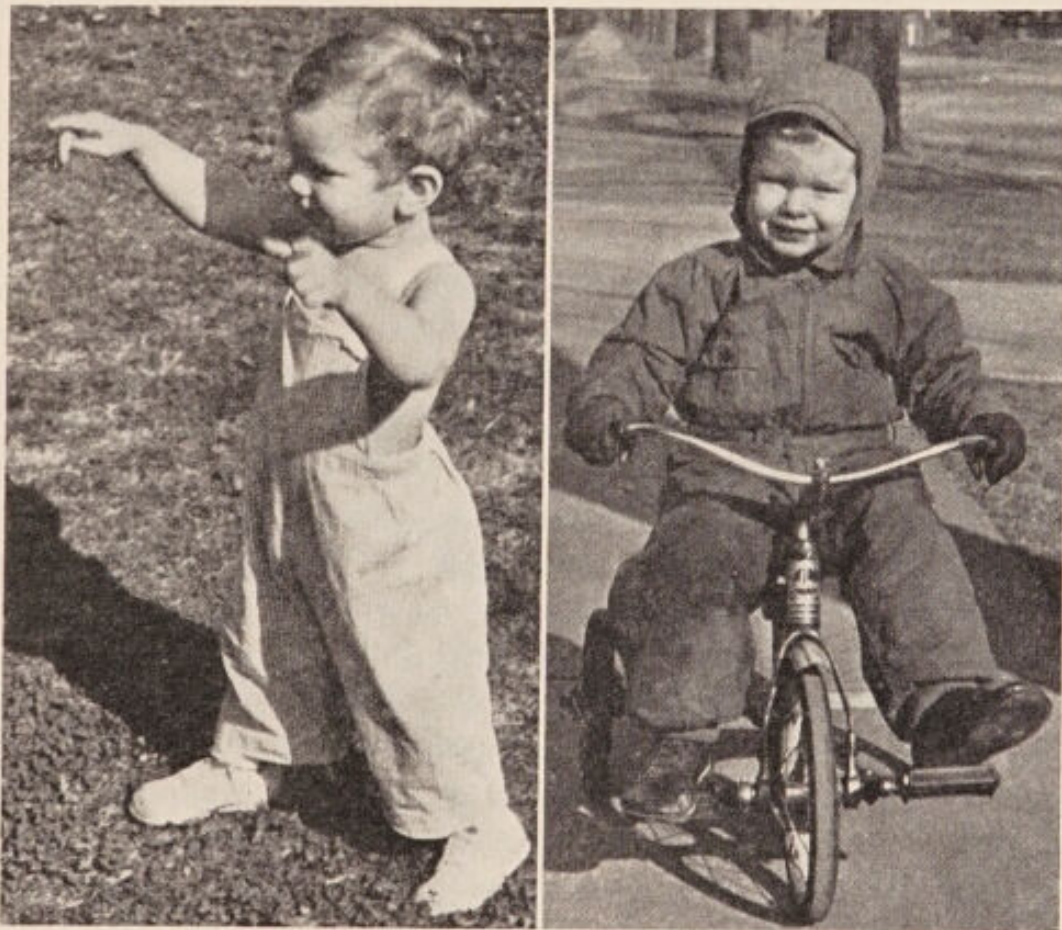
As another illustration of the possible disadvantage of too early development, let us consider sexual maturing. Many children develop sexually as early as nine, ten or eleven years of age. Others do not mature sexually until they are sixteen, seventeen or eighteen years old. Yet all of these children may be classed as normal developers, or as children who mature fully and adequately, whether they develop secondary sexual characteristics at ten or at sixteen. There is no special advantage for a girl to menstruate at nine. In fact, certain social and companionship disadvantages will come to the child who takes on boy-girl interests before the majority of her age or school-grade peers do. There is no implication here that one can control the rate of sexual maturing. Medical prescription may change certain aspects of glandular functioning, but neither parental worry nor environmental manipulation will change the basic pattern of growth.

Children May Be Different Yet Normal.—We must realize that within the scope of desirable development there are wide ranges of individual differences. It is, in general, true that if a child sits up earlier than the average and, therefore, will probably walk earlier than the average, he will ultimately prove to be in advance of the average for his age in most aspects of his general gross-motor development. However, this is not always true. As we have said above in referring to age of walking, some children who do not sit, crawl, creep and walk until later than the average, become more skillful than the average child in their ultimate total gross-motor skills (Fig. 2).

Although it is true that, by and large, children who speak several or many words at twelve or fifteen months, which is earlier than average, often prove ultimately to be superior in language ability; it is true, too, that some children who do not speak any words at all until they are two or two and one-half years old also prove to be superior in ultimate language development. Frequently such children seem to pile up words in some sort of

growth reservoir, as it were, and these words, once released, pour forth in a veritable avalanche. In the same way, some children show no teeth for a long time, but seem to accumulate a reservoir of potential growth. When teeth do appear, several appear almost at the same time, though they appear in the usual order.

In other words, many children who appear to be slow to begin certain areas of development later prove to be thoroughly profi-



A

B

Fig. 2.—A, This child, at sixteen months, is taking his first hesitant steps. This is two or three months later than the average walking-age. B, At twenty-two months this same child is adept on his tricycle. This is two or three months in advance of the average tricycle-age.

cient. It is also true that each child moves along in some areas at a faster pace than he moves in other areas. Some children seem to bend their major growth energies to practice in motor skills, others to language skills and others to social skills. No one of these patterns is to be preferred to the others. It will not benefit any child to compare him constantly with average age standards, with his brothers and sisters, or with neighbor's children. He should

be compared with himself, with his own growth record and with his own rate of progress toward his ultimate maturity in any given trait. He must, in other words, follow the law of his own growth.

A New Viewpoint Is Necessary.—Since this is a fairly new idea in parent education and in child development teaching, let us summarize some of the things that have happened in practice when average age scale standards were depended upon. Using the average standard, parents believed that if a two-year-old child was 37 inches tall, he was superior in some way to other children. By the same reasoning, if he failed to walk until sixteen months, his parents worried about him or felt ashamed of him. Twenty years of records on the same children have shown us the error of regarding children in this manner. Unfortunately, this knowledge has not yet come to the attention of the public, and parents go on anxiously comparing their children with age-scale standards and with other children.

The older philosophy, with its assumption that there was a virtue in the early acquisition of growth steps, has led parents and nursery school teachers to try to "train" children into certain growth stages. Pressure has been exerted to get infants to give up the breast or bottle as early as possible, to become reliable for the toilet, to dress themselves, to pick up their toys and to recite poems and nursery rhymes as young as possible. The idea that vigorous training in early self-care was desirable, that precocious motor or language development was something to coach and to show off, became prevalent among parents. Independence of the mother was fostered by nursery school teachers, who at one time believed it desirable for a child to enter nursery school as soon as he was trained for the toilet and could talk a little. It was formerly the practice to part screaming children from reluctant mothers on the assumption that the quicker the child got used to being independent the better. Recent nursery school practice, based upon continued observation of children through years, has resulted in a gradual weaning of the child from his mother, who accompanies him into his nursery school experience as long as he seems to show a need to have her there.

In current practice we have, or certainly should have, much less forcing of learning, and much more waiting for the child to reveal his maturational readiness for experiences. We now have convincing evidence that we should be alert to the child's first readiness, in the sense that we are alert to provide the environment

essential for learning. Learning should not be forced, however, since the child's capacity to absorb direction and teaching is dependent upon natural growth. The pace of this growth is determined by inner physiological and psychological factors.

Maturational Readiness Essential to Learning.—Recent studies are showing that there are periods or stages of maturation of the organs of the body when these organs are ready to take on certain kinds of functioning. It is only when these organs have reached structural maturity that they can function efficiently and completely.* Only when this inner maturing of the various organs and of the nervous system has occurred, can smooth learning take place. If children are forced to learn any task or attitude before maturing has occurred, they will in most cases either resist openly, or appear to comply, only to develop difficulty later. Forced learning is of necessity undependable because it calls for organic and nervous reactions which the child has not yet acquired. This gives one explanation of instances of learning which seem to have been accomplished, only to "relapse" later.† Under a program of forced learning the child inevitably resists emotionally, either openly or inwardly, since forced learning cannot be synchronized with the structural and functional readiness of the organism. Resistance in such instances is instinctive because it is grounded in a structural unreadiness of the organ which is not yet capable of response or functioning. When learning is pushed beyond the child's inner readiness, the organism itself is violated because the new learning pushes the organism beyond its structural and functional endurance.

When readiness is present, however, pleasure in learning is equally inherent. Children reach out for such learning, and are obviously pleased with their accomplishments. Learning which takes place on a foundation of structural and functional readiness is synchronized and smooth. It progresses with ease and becomes neurologically fixed or automatic in such a way that later disturbances do not break it down. There are few if any relapses. If any given child is moving along at his own satisfactory rate of growth and learning, he is happy, smoothly adapted to the day's routines and fun to have around. If he is being forced, he is bored, irritable, resistant or withdrawn and becomes a behavior problem.

This principle of the need to pace our demands to the natural

*This idea is clearly developed in Richards, Irwin and Wenger.^{293a}

†For another explanation see p. 438f, Chapter XI.

growth of the child may be illustrated by the results of giving very young infants solid food. Digestion of such food does not take place because the stomach of a young infant is not yet structurally and functionally mature enough to handle solid food. The infant either vomits or passes the food mechanically through the alimentary canal in undigested form.

In the same way, a young child cannot learn to feed himself until he has achieved such maturity stages as:

Ability to sit up while making controlled movements of hands and arms.

Ability to coordinate hand and mouth with fair smoothness.

Mastery of sufficient finger control to permit easy holding of the spoon.

Emotional maturity to permit him to surrender at least part of his complete dependence upon his mother.

If we try to force learning before the child is ready, he will behave as he does with solid food which is given too early. He may resist openly, fighting against the attempts to teach him. This is analogous to the vomiting. Or he may appear to learn the task only to relapse later, which is analogous to passing the food through the alimentary canal, but in undigested form. This is what happens when children appear to have been trained for the toilet, only to relapse later.

Maturity Indicators.—We are learning more and more about the way to tell when children are ready for given experiences. As in the illustration of readiness required for the learning of successful self-feeding, certain capacities like those listed above should be present before we start to teach the child to feed himself. In time, it is hoped, we shall know just what stages of development and learning should have been accomplished before toilet controls can be established. We should begin guidance in self-feeding or in toilet control, not when the child is ten months old in the one case or eighteen months old in the other. We should begin these and other aspects of teaching only when the child has accomplished the needed preliminary growths and learnings. *The list of the stages of growth and the accomplishments in learning necessary before a child is ready to undertake any given piece of learning is called a list of maturity indicators*, since the presence of these accomplishments indicates that the child is ready to take a next step in learning.

Another example of maturity indicators is the list of indicators that a child is ready to go to school such as the following:

Physical stamina sufficient to withstand the strain of school attendance five hours per day, five days per week, thirty to thirty-five weeks per year.

Toilet independence.

Ability to leave his mother willingly the requisite number of hours per day.

Ability to cooperate with another authority besides his mother.

Ability to put on and take off outer clothing, like play suits, galoshes and the like.

Ability to share adult attention with other children.

At least some immunity to usual childhood diseases.

Ability to accept the cultural pattern that school is "the thing to do."

Ability to understand and speak the language of the school with at least fair fluency.

Ability to sit still and to attend to ideas or hand work for at least ten or fifteen minutes at a time.

Ability to take a working place as a participator in a group as large as the local school assigns to each grade.

Sufficient form discrimination to permit differentiation of letters and words in reading (for first grade).

Ability to accomplish other intellectual tasks at about the level of average children of five years (for the kindergarten) or six years (for the first grade).

There would, of course, be other such maturities necessary to success in school. This is merely a suggested list of maturity indicators for school entrance. In our culture the great majority of children have accomplished these maturity levels at around six years of chronological age. Many have accomplished them earlier; many do not achieve them until later. It is one of the mistakes of our "average-age-standards" that we require children to enter school at six years, unless they are hopelessly and conspicuously inadequate, and that we do not as a rule permit them the experience earlier or later, no matter what their maturity levels.

Relation of Maturity Concepts to Educational Practice.—This increasing awareness of the importance of regulating educational experience in terms of the maturational readiness of the given child does not mean that there should be less appreciation of the importance of setting the environmental stage or of providing

constructive experiences for children. It should, rather, serve to help us stabilize educational practice so that it neither swings too far on the one hand in the direction of doing nothing until the child aggressively seeks an experience, nor on the other hand of forcing adult-conceived ideas upon children, regardless of their developmental readiness.

How to Judge Readiness, Pending the Development of Maturity Indicators.—At the present time maturity indicators in many areas of growth are available. There are, however, still many areas in which we are only now coming to develop this information. This need not bewilder a parent or teacher unduly, since, fortunately, the child himself tends to indicate to us when he is first ready for any given experience. He does so in one way by the eagerness with which he seeks new experience, seizing with zest upon each new opportunity for activity if it is available. McGraw gives us insight into this. "Whenever any function or aspect of a function emerges, the child exhibits an indomitable urge to exercise it. The baby who has just acquired the ability to roll over can hardly be kept on his back; the infant who has just learned to pull himself up by grasping the bars of the crib does so repeatedly, though once up, he stands and cries, because he has not at the same time achieved the ability to let himself down. Many times I have seen a baby struggle again and again to stand on his feet in order to walk a few steps for a lure, although he could have crept for it with great ease."* As adults we have mainly to see that a desirable growth environment is provided. This would be one which offers opportunities for the right next steps in growth. When the child is ready, he will, as a rule, reach out and take advantage of them.

A child may indicate his readiness for new experience in other ways than eagerness to use opportunities and to exercise a new skill. If an appropriate growth stimulus or opportunity is not available when he is ready for one, he may show his need for new experience by showing boredom with his present regimen. He will fret and appear restless, staring out of the window, or whining, "What can I do now?", or wandering aimlessly about the house and yard. Or he may become destructive, banging or taking apart the toys which are no longer challenging to him.

On the other hand, if we are forcing his learnings, he is likely to fight us with temper tantrums and negativism. If he does not do

*McGraw²³⁴ (p. 128).

this he may indicate his distaste for the activity we are forcing upon him by escaping into activities of his own devising. If he is far enough along in the development of his imagination, his escape may take the form of psychological withdrawal into a world of fantasy.

If we are sufficiently aware of the leads the child gives us, we can usually gage our demands so that he is neither understimulated nor overstimulated in learning. If, too, we know enough about the way in which children progress through the various maturity stages in each of the basic patterns of growth, our understanding of and adjustment to children will be much more comfortable for them and for us.

TOPICS FOR CLASS DISCUSSION

1. Have some member of the class read Breckenridge, M. E. and Vincent, E. L.: "Child Development" (W. B. Saunders Company, 1943), Chapter I and summarize the principles of growth discussed there. How are they related to the principles discussed in this chapter? What difference would an understanding of these principles make in the practical handling of a child?

2. Have someone do the same for Brooks, F. D. and Shaffer, L. F.: "Child Psychology" (Houghton Mifflin, 1937), Chapter I.

3. Have someone prepare a report on the essential principles discussed in Dearborn, W. F. and Rothney, J. W.: "Predicting the Child's Development" (Cambridge, Sci-Arts, 1941). How do they relate to the discussion in this chapter?

4. Have someone read Gesell, A. and Ilg, F.: "The Infant and Child in the Culture of Today" (Harper, 1943), Part I. Discuss how this material helps in understanding growth as a continuous pattern in each child.

5. Have someone report in more detail than was discussed in this chapter the concept of 100 per cent maturity levels as presented in Bayley, N.: "Skeletal Maturing in Adolescence as a Basis for Determining Percentage of Completed Growth," *Cd. Dev.*, Vol. 14, No. 1. (Mar., 1943).

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The Home and Family as a Background for Growth

THE IMPORTANCE OF THE FAMILY AS A SOCIAL
INSTITUTION

Family Life Universal.—It is probable that most of us spend a large part of our lives in families and we carry the stamp of that family with us throughout life, in more ways, doubtless, than we realize. As children we enact in our play the drama of family life, for family life holds the germ for every form of drama in spite of the fact that we may sometimes label it “humdrum.” As preschool children we blithely marry and have five children in a morning. As adolescents, grown wise in the ways of the world and biology and because, in times not too distant our cultural pattern demanded it, we become more reticent and conservative in our plans for establishing a family. But the urge for a family of our own remains and even strengthens in adolescence. The taboo on discussion of marriage and the family because of the sex aspect has fortunately been lifted, and the subject of family life, the choice of a mate, the role of parents and children, is today given the dignity of a place in the curricula of many schools, both secondary and college.

As adolescents it is true we may be “champing at the bit,” wanting to throw off some of the family restraints imposed upon us. But it is a surface rebellion, possibly only making us the more eager to establish our “own” families as something of an escape, but not influencing us to discard the idea of the family as something to be desired. We are born into families and live in families. Although the economically independent single woman today is often found in the large cities living in clubs or apartment hotels, there are still many who form small groups and set up some form of cooperative family living with its attendant responsibilities as well as its attendant compensations. We live in families if we can, and we would die in families. The old, wherever they may be, whether living alone in the shell which once housed their family,

or in some place far removed from it, whether in the home of some relative or in the home built for aged which must spell itself in capital letters HOME, cling to the material evidences that they, too, were once part of a family and treasure their various reminders of the family life that has gone.

General Recognition of the Importance of Family Life.—If one scans the book shelves of today from the scholarly to the popular publications, the magazines from the scientific to those with a mass appeal, articles, stories, and even advertisements, those quick indicators of popular interest, if one reads the newspapers, listens to the radio, or seeks any reflection of the public's interest, one finds evidence of a growing concern and articulated belief in family life. True, that the war has had most attention in the immediate past, but interest in the family is nevertheless obvious. Wars come to an end, but the family remains.

Society in its social work today places the emphasis on family life in some form, and tends to board the children who for one reason or another have been deprived of their own families, with other families instead of putting them into the old time institutions. In 1909 the first White House Conference expressed itself in the resolutions adopted as believing in "the conservation of family home life as 'the highest and finest product of civilization,' not to be broken for reasons of poverty, but only for considerations of inefficiency and immorality." It also gave "an emphatic endorsement of the doctrine that 'the carefully selected foster home is for the normal child the best substitute for the natural home.'" At the third White House Conference in 1930 the third clause of the Children's Charter is as follows: "For every child a home and that love and security which a home provides; and for that child who must receive foster care, the nearest substitute for his own home." One might suggest an amplification of that sentence, for the deplorable fact is that not all homes provide children with those two essentials, "love and security," and that clause might well have read "the nearest substitute for what his own home should have been." However, the whole conference was permeated with the conviction of the importance of satisfactory home life for the child and the necessity for education of individuals to prepare them for parenthood.

The fourth White House Conference of 1940, coming at the close of the period of our greatest economic depression and as we, on the brink of a cataclysmic World War II, were becoming

increasingly aware of the threat to the democratic way of life, considered Children in a Democracy. But the emphasis on the importance of family life for the child's optimum development is apparent throughout the report. It is significant that this report gives heed to the lack of religion in our children's lives for it states that "it has been estimated that approximately one half of the children and youth receive no formal religious instruction," a lack for which the family is certainly largely responsible. Have we as a people lost sight of the child as a spiritual being who must find his relationship with God as well as with Man if he is to become a well integrated individual?

Although children's institutions, once called asylums, now more often called Homes, still exist for many children who for one reason or another are not boarded in families, they have been influenced by this emphasis on family life. Large groups of children separated by sexes, regimented in dormitories, regimented in dining halls, clothed alike in dull clothes of the same pattern, are fortunately less often seen than formerly. The adequate institution seeks to duplicate family life in so far as it is possible. The children under its care, separated into smaller groups of boys and girls together, more nearly comparable to the family group, live in cottages, where with varying degrees of success there is at least an attempt to provide that home atmosphere which gives them a feeling of belonging, of having status, of being with people who *care*, an all-important experience for children to have.

To some extent there is an effort today to provide the family setting for the aged as well as for children and we seek to find families with which they may live and of which they can be a part in preference to institutional life. In fact we look upon the family as so important to the development and happiness of the individual that we believe every effort must be made to provide those family values.

The time was when economic failure was considered a valid reason for the break-up of the family. If parents were unable to support their children, or widows were left without the means to support them, the solution was often the removal of the children from the home. Today this is no longer the case. Society, in the form of the state or of private philanthropy, preserves the family whose only failure is economic. It is the family which has drastically failed in its *social* or *educational* function to the individual that the state says can no longer exist. It is true that the failure

must be drastic, sometimes even dramatic, before the state steps in, but children can be taken away from parents today for cruelty, neglect, immorality and other failures on the part of the parents which were not considered justifiable reasons in the not-too-distant past when the family was frequently broken up because of its failure economically. And when the family does fail we still consider family life so important that we look to other families to carry on those functions so necessary to the growth and development of the child.

The Child Inherent in the Meaning of Family.—Why this emphasis on family life? What is the family, why is the family and why is it important?

The family is the oldest of our social institutions. Students of primitive society tell us that the institution of marriage is rooted in the family, and not the family in marriage as one might suppose from the chronological order in which they now appear. Marriage, even without the legal or religious connotation of today, in its fundamental meaning is understood to be the more or less permanent union which is maintained between male and female and which seems to have developed permanency because of the cooperation in caring for helpless offspring. Marriage is not an institution peculiar to man alone, but is found even in permanent form among certain mammals and birds where the habit of cooperating in life activities has become established and has affected both members of the union to such a degree that they become mutually dependent and choose to continue to live together.

It was not necessary to develop marriage for the satisfaction of sexual desire, a transitory and recurrent thing. It was necessary, however, to care for the child during the period of his helplessness. Thus the two individuals of whom that child was a part developed the habit of living together in order to care for that which, at least biologically, was jointly theirs. In this living together and assuming a joint responsibility they evidently found a satisfaction and an incentive to effort that did much to establish the permanency of the family. Part of the instinct for race preservation appears to be an instinct for nurture which is common to all those forms of life where the offspring has a period of helplessness, for unless cared for, the offspring will die, and the instinct for race preservation will be thwarted. When this instinct for nurture is felt jointly and when family life is maintained, we have the institution of marriage. The child, therefore, has been the preeminent factor in

establishing the family, and the family, not marriage, is the basic institution.

The word family has been given various interpretations. To some it has meant a broad, a sometimes vague term including blood ties of various degrees of strength on one side of the family or another. Usually the emphasis has been on the paternal relatives of the same name, although there have been societies in which the family group has been centered around the maternal relatives. To others it has meant the group of two or even more generations living under one roof and has, especially in older civilizations, included those who served the household as well as those held together by ties of blood. But wherever it has been and whatever its form there has been the child. The child makes the family and the family is the institution in which we have chosen and evidently still choose to have the child spend most of his childhood.

The Necessity for Study of the Family.—It is perhaps curious that such an old institution with which we have been so intimately connected has for so long failed to catch the attention of students of social institutions, and has gone its own way until comparatively recently without arousing anyone to an intensive study of its history, development, meaning or purpose. The very fact, however, of its nearness to us and our intimate connection with it, has perhaps made us take it for granted and feel little concerned about trying to trace and understand its development as we have various other of our institutions. But the family is at last claiming our attention as we have already noted, and scholars are giving us the results of their study and research on the various aspects of marriage and the family. What the family has done, why it has done it, and what it may do are becoming increasingly important to us for we are realizing what a powerful factor biologically, economically, physically, educationally, socially and religiously it has been in the history of the world. We know that we must understand it if we are to use it intelligently and if we are to modify it or change it in the interest of social progress and the development of the individual.

Everyone of us has had some connection with a family. When we are scrutinizing the family, therefore, we are looking at something of which we are a part, and it is inevitable that anything of which we are or have been a part involves our emotions. It behooves us, therefore, in scrutinizing this institution, the family, to bear this fact in mind, and to be watchful of our emotional bias

lest it betray us into wholesale commendation of the family as it has been and always should be, or into wholesale condemnation of it as an institution which has failed us. Perhaps among students there is little likelihood of wholesale commendation of the family as it has been, although it is easy to commend wholeheartedly some particular phase of family life which is dear to our heart. We must remember that it is old, with an age that no other institution has, that living things which are old are not malleable as youth is malleable but that this does not mean that it has no capacity for change. Growth and development are characteristics of life, and the family as a living thing must and does manifest those characteristics. It must discard age-old customs and attitudes if, in the light of critical analysis, they are found incompatible with the civilization of today. We must also remind ourselves that all that is old is not necessarily worthless although some things that are old have in truth outlived their former values and should therefore be discarded.

SOME OF THE IMPORTANT ASPECTS OF THE FAMILY

The Biological Importance of the Family.—Biologically the family has been important because it has provided population. The quantity and to a certain extent the quality of posterity has been determined by families. Statistics show that children born of a transitory sex experience, where there is no thought of establishing family life, have less chance of living than have the offspring of those who have proclaimed their intention of living together. In other words the mortality rate for babies of unmarried mothers has been found in various studies to be from two to three times as high as the death rates for babies whose parents are married. We recognize also that the biological inheritance plays its part in making up the quality of the individual as well as do the influences of the life experience, important as those are. The new-born baby is not a mere mass of living cells arranged in a certain order, but has at least the bud of a personality. His inheritance has been established before birth, whereas environment will do its part later, influencing the growth and development of his personality. In the early years the environment will be largely provided by the family. Nature and nurture both have a share in making the individual what he is and nature and nurture are of the family. The environment is a flexible factor largely controlled by the family and especially the parents. It must be borne in mind that the

family gives to each child a different inheritance, except in the case of identical twins. It likewise gives a different environment to each child, for no child comes into a family exactly like the family into which the former child came and no two children are treated exactly alike. It is not to be wondered at, therefore, that children in the same family are different.

In recognizing that inheritance has a share in making the individual, we must avoid the danger of crediting or accusing heredity of being entirely responsible for a trait or characteristic which in many instances may have been the result of influences playing on the child since birth.

The Educational Importance of the Family.—Quality, then, is due partly to biological factors and partly to environmental factors. From the moment of birth the child will begin to respond to the world of people and things with which he is surrounded. He will learn about life and develop attitudes toward it, and his family will be largely responsible for his learning.

In the first five years of his life the child will without doubt be doing more learning than he does at any other five-year period, and most of the learning will be done within the family setting in spite of the increase in nursery schools in this country. He speaks the language his family speaks. He knows certain things about the world about him which his family knows. His family has been his source of knowledge. If they do not know, the chances are he does not know. The family culture will tend to be the culture he accepts. If their speech is correct, his will tend to be correct, although he will doubtless go through a stage of experimentation with forms of speech which may shock and will certainly astound his parents. If the knife is the acceptable way of getting food into the mouth at the family table the child will use that method and find it hard to drop if he becomes motivated in later years to adopt the fork. He has also caught from his family certain attitudes toward life, himself and his fellowmen. At five years of age we may speak of a child, for example, as self-reliant, generous, kindly, sympathetic, respecting the rights of others, respecting property, respecting authority, or we may use descriptive adjectives with very different meanings. How did he get that way? The answer seems to be "His family has been largely responsible." Foster says: "It (the family) has been and perhaps still is the most potent educational influence in terms of specific training, personality formation, and cultural transmission and interpretation."*

*Foster, 120

It is true that the family is no longer serving so completely as the institution which is to meet all of the child's educational and social needs. The school, an institution which is young in years in comparison to the family, takes him for part of the time at an earlier and earlier age;* camps during the holidays take an increasing number of children.† Nevertheless the family remains as an important educational force in the child's life as will be emphasized throughout this book.

The Economic Importance of the Family.—Economically the family has been so important a unit that some people have claimed that it is because of its economic importance that it has endured as an institution. Until the development of machinery ushered in the industrial age the family was the great productive unit as well as a unit for consumption. The family has held the land and other forms of property, and through its hands property has passed from one generation to another. The state up to the present has protected that right although what the future may say in regard to the passing on of property seems less sure than in the past. The state is certainly reaching out to take more of a share from family estates than formerly, and it is not inconceivable to think of a time when the state will no longer acknowledge the right of an individual to inherit a great property or possibly even amass it for future use. For the present, however, the family must still be considered an important economic unit because of its control of property.

The family has not only been important economically because it has been a producing unit and has controlled property but because it has been the great motivating force which has incited man to work. The family has also been, particularly in the past, a strong force influencing the type of work undertaken by the sons of the next generation. It has likewise cared for the dependent, the children, the sick, the elderly, and because of these functions has been of economic value. Legislation of the last few years has been expressing the will of the people that some of the economic burden shall be lifted from the shoulders of individual families because in so many instances it is a burden too heavy to be borne. The

*Nursery schools, which have been developing in this country during the past twenty-four years and which had their beginning in England, are taking children at two years for from three to six hours during the day.

†Private camps, Scout camps and camps run by other organizations have sprung up in great numbers in recent years.

Social Security Act passed by Congress in 1935 has provided means for the care of the blind, the elderly, the dependent, and the care of orphans in families.

Today the family seems to be less important economically in that it is no longer the focus for production. The fact that it has ceased to be a factor in production means that much of the work that woman did in the home has passed into other hands. When production in the home was on such a scale that it called for the help of many who worked under the direction of the woman in the home, it called for a display of considerable executive ability. Under such conditions a woman was a producer of goods and therefore had the economic value and the satisfaction in production which a producer has. Today her economic value in the home may be found in her ability to handle expenditures well, but her function as a producer of goods in the home as well as her satisfaction in this activity are largely gone. The bakery, the cannery, the mill do for the mass what woman used to do for her family.

It was to be expected that as some of her work left the home, woman should follow and take her place as a wage earner in the industrial world. No longer a producer of commodities at home, her economic value was somewhat reduced. Consequently, in those homes where the woman's economic contribution was essential, she had necessarily to contribute that economic support by becoming a wage earner.

To other women the loss of work in the home meant that the hours formerly devoted to industrial production at home were left unfilled. No economic pressure forced her to follow the work outside the home and the Penelope who had directed the work of her handmaidens found herself for a time without outlet for her abilities. The adjustment which such a change in family activities called for has been a difficult one to make for many reasons. But it is important to bear in mind that the loss of the home's importance as a productive unit with the accompanying necessity of woman's adjustment to this loss has had a far-reaching effect upon the status of women, a subject which will be discussed in more detail later.

CHANGES TAKING PLACE IN THE FAMILY

Modification of Patriarchal Type.—For a long time in the history of our civilization the patriarchal type of family has been the predominating type. Our laws and customs have grown up

around the idea of the family as a social unit in which the father has been the final authority, religiously, economically and governmentally. Time and place have made some difference in the amount of power accorded him, but the family has remained patriarchal. Today, however, this is less universally so, and the signs of the times indicate that the patriarchal type of family must be and is being greatly modified, although we find great differences in the pattern of family life in the different parts of our country with its divergences in racial streams.

The family is certainly changing; perhaps within this century it has changed more rapidly than it has in centuries before. The law in the United States, and in other countries as well, no longer consistently grants the father complete ownership of his family. No longer is his word law without question on economic, religious and governmental matters of the household. The state long since in so-called "civilized countries" took from the father the right to say whether or not the child should live. It says today, although far from universally and in varying degrees of force, that the child shall be cared for and not abused, that he shall be educated, that he shall labor only under certain conditions, and that the mother, as well as the father, shall have certain rights of guardianship.

The patriarchal type of family is still in our midst, however. There are plenty of evidences of this, and we should not necessarily wish to abolish every evidence of it, simply because we are attempting to greatly modify it. Legally, wives still take the surnames of their husbands when they marry, and children bear the father's name. Wives are today in some instances, especially when embarked upon a career, choosing to carry on under what they call their own name, but they must remember when they are insisting upon doing this that they are in reality bearing their father's name and are therefore merely identifying themselves with their father rather than with their husband. They are not altering the fact that the man stamps his name on the family.

Our laws still look upon the man as the one who is responsible for the support of his family, and in divorce the wife, not the husband, is usually granted alimony—a situation which obviously needs reviewing and probably revising in these days of childless marriages and woman's economic freedom. Added control in family affairs for the woman should mean added responsibility, and therefore in the modification of the patriarchal type of family

woman must realize that in the reallocation of control she will inevitably have new responsibilities with her freedom. It would seem as if the aims should be, not so much a shifting of power, as a joint assumption of responsibility with an allocation by mutual consent of certain functions to the one in the partnership best fitted to assume them. In the purely patriarchal type of family this mutual division of responsibility does not exist. Whatever power woman has had, and it must not be denied that she has had power even in the patriarchal family, she has had to wield subtly, exercising her wiles to get that which no law recognized as hers by right. That she still does this in spite of the fact that we are trying to evolve a democratic type of family life is evidenced by the Burgess and Cottrell study, for it is stated by them that "The majority of wives must still achieve their aims in subtle and indirect ways which evidences the dominant position of their husbands."*

Changes in Status of Woman and Their Effect on the Family.—

Various factors have brought about changes in the family. Changes in industrial conditions and the increased economic and educational advantages open to woman have made it unthinkable that she should continue to be as she was in the past without legal status of her own and under the complete domination of the male head of the household, without property rights, and without guardianship rights over her children. Changes in the divorce laws have followed the recognition of the rights of women, and with these changes marriage has become a less permanent thing than it was in the days when women were without the educational equipment which might make them economically independent.

Women Who Work and Their Reasons for Working.—The educational advantages open to women today have widened their vision and opened up many paths of work hitherto unknown to them. Women are in business and professions as never before, especially since World War II. The "women who work" (a phrase which amusingly is used in such a way that it excludes the woman at home—as if she did not work!) are found not only among those women who are compelled to work in order to feed hungry mouths, but also in other economic groups. In some cases they represent women who desire to pursue their profession or their business, even though married or perhaps instead of marriage. If married they may choose the pursuit of their profession or busi-

*Burgess and Cottrell⁶⁰ (p. 342).

ness instead of children, or they may attempt all three—marriage, children, and a business or professional career. A woman may choose a career in order to maintain a certain standard of living to which she has become accustomed and which she feels is essential. There are standards for maintaining health, standards of education, standards in the cultural life that a woman and her husband as well may feel must be maintained not only for themselves but for their children. Yet, the maintaining of those standards may place an economic burden upon the husband which is more than he can carry. The wife, equipped with the education which has made her economically independent in the business or professional world, and realizing that in this modern industrial age certain functions have been removed from the home, decides that she wishes to continue in her earning capacity with the exception of such time as she must miss because of childbearing. Such women assume part of the economic burden and are indeed partners of their husbands in this family function.

Some women, because of the pleasure found in the work itself and because they feel adequate in the business or professional situation and inadequate or almost helpless in the home situation, choose to continue with their work. There are women who frankly acknowledge that although biologically mothers they are not temperamentally fitted to be mothers. They say that they are more successful in business, that household care and the care of children irk them, and that they prefer to work and pay someone else for taking care of their children. Grant that they may not be temperamentally fitted to carry on this important function of giving children the right start in the world from a physical, mental, social and spiritual point of view. They must, nevertheless, recognize this aspect of motherhood as an important function—one which calls for skill of the highest type. They must not think that a little supervision from mother night and morning with hours of the day under the care of an untrained maid will suffice. Crises with little children may arise at any time during the day, and they call for intelligence and wisdom of a high order if they are to be met in such a way that the child is not harmed. Women who do not wish to assume the care of their own children must look to those who have undertaken the care of children as a profession to “carry on” for them and must be willing to pay for the service on a professional basis. They must also be willing to accept the possibility of the children, during early childhood at least, turning for comfort

and succor when needed away from the mother and to the one who gives them care and therefore a sense of security.

Economic Value of the Woman as a Home-Maker.—If the woman is continuing in business solely for economic reasons, she must bear in mind the fact when making her decision that if she were to give her attention to the management of her home she would have an economic value even though not readily expressed in dollars and cents. The woman as the one in charge of the spending of money has an economic function as well as the person responsible for securing the income. The home which is economically run, where the money is wisely spent, is the home where one usually finds some one person in charge of this matter. Buying in such homes is not done in a hit or miss manner, but is the result of careful consideration on the part of some one individual, for a budget does not run itself. Waste and unnecessary repair are avoided because there is someone in charge who feels a responsibility for such matters. In spite of the many changes that have taken place in the home the woman still has an economic value as the one in charge of the household. It is often hard, nevertheless, for the woman who has received her weekly or monthly check for services rendered, to appreciate an economic worth which expresses itself in less concrete form than the monthly check. Women are often reluctant to give up the satisfaction found in actually earning their own money, and a monthly check from the earning husband to the home manager for her important work as such is sometimes the way in which this hurdle is surmounted. The woman does not submit so readily today to what she considers the humiliating situation of having to ask her husband for money from time to time as she needs it. If she is of value in the family situation even though not contributing actual money there should be some recognition of the fact.

Management of Family Finances.—Whether the woman works inside the home, which was in times past the universal custom, or outside the home as many do today in our American life, the question of the management of the finances inevitably comes up for consideration. In the patriarchal home there was no question about the matter. The man held the purse strings and the woman submitted even to having her fortune pass into the complete control of her husband. This is not so today. The law has accorded the woman certain property rights. Her property is hers, to do with as she will, not her husband's. She may have had experience

in managing money; the finances of the family are not beyond her; she wants to have a part in the management of them. There are various ways in which the family meets this problem of financial adjustment. Sometimes there is a household allowance which the wife may manage in whole or in part, sometimes a joint account, sometimes other arrangements are made as we work our way slowly toward a more democratic form of family life. The question of family finances is an ever present one, often involving various tensions, the problem of living within one's income, of deciding as to the essentials and the nonessentials in the way of expenditure, of possibly harmonizing two points of view in regard to standards of saving and spending. It calls for the thoughtful, honest, fair-minded consideration of husband and wife if intelligent budgeting is to be achieved on a democratic basis.

One phase of the question must be viewed with fair-mindedness especially by the woman. Woman is so new a comer in the business world and her experience there has been so much more as an unmarried woman than as a married one, that she may easily look upon her earnings as peculiarly her own and not belonging to the family pocketbook. Man has for so long been the earning member of the family that he feels it is his burden to carry the household finances, and he may look upon his wife's earnings, or personal income if she has property, as something belonging to her for her clothes, her vacation, her particular pleasures. Such an attitude on the part of either husband or wife is not in reality a partnership attitude and may give rise to a situation in the family which is far from democratic. From this it is again evident that it is not an easy matter to slough off patriarchal traditions and practices and to make the family in reality the democratic institution which it seems to be striving to become.

The Acceptance of the Married Woman in the Field of Employment.—In many instances even before the war the woman who continued in the field of employment after marriage had become accepted in our culture. But her acceptance as a working wife was not easily won and she was still to some extent penalized by finding that certain positions were not open to her, although these barriers broke fast under the impact of war needs.

The idea of the husband as the one who should support the family was so deeply entrenched in our thinking that man saw it as a criticism of himself as failing in his duty if the wife worked. Man had without doubt found it difficult to accept the working

woman as encroaching on his field and therefore representing something of a threat to his security. He could not but see the working wife as a threat to his status, as a responsible husband.

The war has inevitably accelerated to a marked degree at least a temporary acceptance of the wife and likewise the mother in the vast field of work outside the home. She has been called upon to do practically every type of work, work never before dreamed of as woman's work in this country, and she has responded to the demand. Patriotism, her loneliness and tension if her husband were at war, the promise of greater financial ease, have all or in part been strong motives to pull her out into the field of employment.

The Problem of the Care of Children of Working Mothers.—For the childless wife employment has meant in most instances simply the turning of the key and leaving her home empty for the day. For the working wife with children and sometimes with an elderly invalid relative to care for there has always been the problem of meeting their needs, and war has greatly increased this need. Although a certain amount of publicity was given to the importance of a woman's job as home maker and mother, especially if the children were young, the pull of industry's need was too strong and women poured out into the so-called "working world" during the war. The needs of an increasing number of children had to be met in some other way since the mother was away from the home so many hours in the day.

Although the contribution of the grandmothers, either in their own homes or in the homes of their married children, deserves special mention in relation to the part they have played in taking on the care of children during the crisis; it was a problem of greater magnitude than could be solved entirely by calling on the grandmothers. Nor could it be met by employing maids, as mother substitutes, for they too went into war work. The home was in danger of being adrift with no one at the helm for many hours in the day, and many homes have in reality been adrift.

The Day Nursery and the Nursery School.—But fortunately we had two institutions in our midst which had helped the mother who worked in the days before the catastrophe of war. In the days when it was generally accepted that the mother who was in economic need should work outside her home to support her family, the philanthropically minded saw the Day Nursery as the solution and in the latter part of the last century the Day Nursery sprang

up in many a community. Its purpose was to care for the children of working mothers, often from babies to school children, during the hours of the day when the mother must be at work. As the philanthropically minded grew into the socially minded (for there is a difference) some questioning arose as to whether or not removal from the home was the best solution for this problem. For a special group another solution was devised, that is the widow's or mother's pension, which allowed the mother to stay at home and care for her own children instead of putting them in the care of someone else for part of the day. This legislation together with the development of higher standards for day nursery care slowed up to some extent the hitherto rapid increase of Day Nurseries.

Shortly after World War I another institution appeared in our midst, coming to us from England, namely the Nursery School, an institution which must not be confused with the Day Nursery. In the term Day Nursery the word nursery refers to a place, that is the *place* where children are cared for. The Day Nursery was a place organized to care for children of working mothers during the day. In the term Nursery School the word nursery refers rather to an age. The term Nursery School meant a *learning* place for the *young* children who are usually found in the nursery of the English home and not thought to be of school age. But the Nursery School sees this as an age when much important learning takes place through group living for part of the day with other children of approximately the same age and under the guidance of people trained for this work. The Day Nursery was principally a philanthropic institution, the Nursery School is primarily an educational institution. During the years there has been modification of both ideas, the Day Nursery having been definitely influenced by the Nursery School philosophy. The Day Nursery has expanded its concept of what care of children means; it has become increasingly aware of its responsibility for the total development of the child and has instituted a better program for the children under school age who are in its care. The Nursery School has frequently been a partial solution for the business or professional mother as it has cared for her child under five for possibly six hours in the day. It was not until the early '30's brought us into the period of great economic emergency that Nursery Schools developed to any great extent. At this time they received great impetus from the establishment of the Emergency Nursery Schools under Federal control. These schools offered employment to women in absolute

need of employment and relieved economically depressed homes of the care of the children under five for part of the time.

Thus through earlier experiences we were made ready to meet the problem of the care of thousands of children in World War II whose mothers went out from their homes into war industries. A complete discussion of the organization of the Child Care Centers is not within the province of this book. Suffice it to say that society has recognized its responsibility for the care of the children whose mothers work and has likewise more generally accepted the idea of the working mother. It has become a public function to care for these children rather than completely the function of the few who once recognized this need and voluntarily contributed money to the support of our first Day Nurseries.

Effect of Postwar Days on Women's Work.—What will happen now that the bells have rung proclaiming that war has ceased? Who can say at this writing? One *can* say "we will not go back to things as they were before the war." One does not *erase* the effects of war. Its impact on society goes too deep for that. Thousands of women have found certain satisfactions for themselves in work outside the home. Doubtless many of them will want to continue with such work. Others look with eagerness toward serving again in a home capacity and will gladly withdraw from the industrial world. Probably much will depend on our economic condition. If work is available at good pay or is demanded of women they will work. If there is not enough work for all, the women to a great extent will give way to the men. But women are keenly aware as never before that they *can* work in the business, industrial and professional fields. No sense of their inadequacy will keep them in their homes, but rather the deliberate decision that the home and children offer them the opportunity for finding the deepest satisfactions in life and developing their especial and greatest abilities.

Necessary Adjustments in Home Management When the Wife Works.—In spite of the fact that mechanical inventions and industrial developments have lightened the home tasks, the fact remains that there is still work to be done in the well-run home even though in the small apartment in the city it can be reduced to a surprising minimum and even though the children are cared for part of the day in some outside institution. Caring for little children is a twenty-four-hour responsibility and cannot all be done during the six to eight hours outside the home.

How then shall the essential home tasks be carried if the wife works outside the home? If she is her husband's partner in carrying the financial burden, may he not be her partner in some of the home duties and share with her in the care of the house or of the children? Should he not learn about baby feeding and some of the other aspects of child care as well as his wife? Is there any reason why he should not help in the care of the sick child if his wife is carrying as heavy a work program as he is? "H.W." (housewife) are the initials one finds on records indicating that a woman is staying at home caring for her home. If in addition to being a housewife she carries on a business or profession, is it not fair that the husband become something of an "H.H." (house husband)? If the husband is indeed to share with his wife in the training of the children and really function as something more than a biological father, should he not, as well as she, know something about what the care and training of children mean, irrespective of whether she is engaged in some business or not? The answer to this question has been in many instances "yes" and we have found in that answer another evidence of the democratic form of family life which is emerging in our culture.

Mention has already been made of the fact that the family has economic value in that it has frequently cared for the economically dependent elderly relatives. Although this is true we must not forget the fact that the elderly in many instances have made an economic contribution to the home, especially if the mother were employed, through the burden of household work which they assume. Nor must we forget that an elderly person in the home may well contribute other values to home life as the children learn consideration for such a one and find happiness in companionship with old as well as young.

The Home Maker as a Citizen.—It is sometimes said that, as the home became of less importance as a productive unit with the development of machinery for mass production, there was a loss of opportunity for the woman in the home to make use of her special abilities. The woman who took her place in the business or professional world profited by the simplification of household duties, but the woman who did not have this outlet for her abilities or energies was in the position of one who had lost at least part of "her job." This has seemed especially true for the woman whose children are grown beyond the need of her constant attention. Better educated than formerly, sometimes a worker before her

marriage, with increased leisure time, what was she to do with it? The answer is that she has become an effective citizen in her community. She has won the vote, she has become active in civic affairs, she has represented us in Congress, she has given of her time and energy to many an important project in her community, all this in a way that has made a contribution of inestimable value to community life. The level of volunteer work has been appreciably raised in communities where mature experienced women have joined the ranks of the volunteers. In times past these ranks were largely filled by young unmarried women of leisure who sought some outlet for their energies and enthusiasm but who lacked the stability which experience and training usually give. This is not the present picture of volunteer work. The young unmarried woman of leisure wants a job today or if not a paid job the trend is toward training her for her job as a volunteer worker. She stands side by side with the home maker who seeks some opportunity for service outside her home. To the home maker contributing to her community outside the home as well as within the home comes the stimulation of wider interests that doubtless enhances her value as a home maker. Wartime needs swell the ranks of volunteer workers and unearth a vast amount of ability which could be well kept at work on peace time needs if those needs could be made to have the appeal that war needs have.

The Decrease in the Size of the Family.—The large family of colonial days is no longer a part of our American picture. It is true that one does not find so many infant graves in the family burying lot, for various public health measures have lowered our infant and early childhood deaths, but the birth rate has fallen even more. The family of seven or eight children is seldom seen today, and the family of two or three is the more usual one. As is true in relation to so many changes, one can find assets and liabilities in this change. For the mother there has been a lessening of the burden and hazards of childbearing; for the children there are better opportunities in the way of education and other advantages. But there is also the loss of the intimate companionship of brothers and sisters through which so much may be gained in the way of learning to live with one's peers.

To some the decrease in the size of the family seems to mean that people do not want children, and although this is true in some cases the great majority of husbands and wives are eager to be

parents as well, feeling the incompleteness of the home which has no children.

Instability of the Family As Evidenced by Divorce.—As we have discussed some of the changes taking place in the family the point has been made that the trend is away from the patriarchal type of family toward a more democratic form of family life, and we find this good. Yet as we go through this period of transition we find that all is not well with the family. Its weaknesses and hidden failures of the past as well as its failures of today are coming to the surface and are easily discovered in the light of the critical attention which students are today giving this age-old institution. It is no longer the stable institution it was in the days when complete authority rested in the husband and father and when conditions were such that life was centered more within the family than it is today when work and play are both found outside the home. Its breakdown is more obvious than formerly and the rising tide of divorce is looked upon, especially by those who consider marriage a sacrament, as a serious menace and an indication of the evil effect of modern conditions upon family life. To these critics divorce is a disease and in its modern aspect a very serious disease. To others this rising tide of divorce is a *symptom* of a disease that has existed a long time—disintegration within the family—an outbreak against intolerable family situations which men, women and children are no longer called upon to endure. Statistics would indicate that it is something of both. In so far as it indicates an impatience and unwillingness to make the effort to adjust to married life, it is perhaps a modern disease, certainly a serious one, representing the undesirable by-product of the modern cry for the rights of the individual without due consideration for the rights of the other individual. In so far as divorce is a symptom that the family is going through a process of change from the patriarchal to the democratic type and that our ideal is an integrated group growing harmoniously together, it may be considered a symptom that we are struggling toward that ideal. We are uncovering a canker which has existed in many a family of other days but which at that time our culture said must be hidden.

There has been a change in our attitude from the days when divorce was considered a social disgrace to be prevented at all costs, which is evidenced by the fact that in 1937 there was one divorce out of every 5.7 marriages. Statistics indicate that the

divorce rate has grown from 28 per 100,000 population in 1870 to an estimated 200 per 100,000 population in 1940. No such rate of increase could have occurred without a change in attitude or change in mores.

Certain fluctuations in the divorce rate point to a relationship between economic conditions and divorce. Prosperous times, an increase in divorce; economic depression, a falling off of divorces. Why? One cannot answer that question definitely. Does a common anxiety such as financial catastrophe draw people together? Does it help toward a truer evaluation of what is worthwhile in life? Do ease and plenty soften the fiber of the individual to the point of unwillingness to bear any of the strains of married life? Certain case histories taken during the time of economic depression would lead one to believe that such was frequently the case. The question that then comes to mind is: does the sense of proportion which came with the time of anxiety last? In times of plenty there is the money to get the divorce and usually a job for the woman after the divorce. She does not *have* to stay married for economic reasons.

Social pressure used to keep people married. Today religious pressure is still powerful among certain groups but social pressure of this nature hardly exists in many. Yet, even though we may consider this increase in divorce an "ill wind," it may in the end blow some good, for it has been one of the reasons why we have turned our attention to marriage and the consideration of how it may be made a success, for if the family is to achieve its fullest values, marriage must be a success.

EFFECT OF WAR ON THE FAMILY

What has the war done to the family? It is impossible to state absolutely for the effects of war are far-reaching and perhaps beyond complete evaluation. We know that wars have never destroyed the family for it has survived the many wars to which mankind has subjected itself. There is a resiliency to the family for which we can indeed be thankful.

Statistics from the last war and from World War II, in so far as they have been gathered, tell us what we probably guessed, that at the beginning of war and as the time for actually going off to war approaches, the marriage rate rises sharply and that at the expected time the birth rate also rises. Later, when the men have gone to war and as the war continues, we have a society deprived

of thousands of the young unmarried men, and the marriage and birth rates must necessarily fall. The postwar statistics for World War I indicate that we may expect the marriage rate to rise after World War II, making up, as it were, for the inevitable slowing down under the war situation.

Reunion of Family after the War.—After the war we face the days when members of families who have been separated because of wartime conditions will be reunited. Some will belong to families that were well established before the war came to disrupt them, families promising stable happy family experiences for their members. The individual members will come together again, eagerly anticipating the reunion, *not unchanged* by the war (to remain untouched would be an impossibility for anyone who lives through it with any sensitivity whatever). The children will have grown; a baby may have come whom the father has not seen; the wife has carried oftentimes heavy home duties by herself; the husband has lived with sights, sounds and dangers that the families of this nation have not been called upon to experience. Those who were well adjusted emotionally, mature people with the spiritual strength to carry on, will adjust to the changes that have taken place in each one of them, even though some of the scars go deep. These families will not increase the divorce rate, for these families will go on.

But the rise of marriages in the early days of the war means thousands of marriages made on the rising tide of emotion present as a nation turns to war. Some of those marriages were between young people whose intention of marriage already existed before the war and who, because of the changed conditions, simply hastened the day. They may have been obliged to separate too soon to establish firmly that ongoing process of life together, but the possibility of fulfillment is probably good even though they are each deeply affected by the intervening months or years of separation. The way for them may be more difficult than for the family which had really become a family before the war, but their foundation seems more surely laid than the marriage which has in it all the elements of what is truly a "war marriage."

The Hasty Marriages of War.—In wartime many marriages are made on very short acquaintance in an atmosphere charged with heightened war emotions, marriages between two who have had no opportunity of knowing each other and who if they did know each other would find their backgrounds and life experiences

were such that their attitudes toward life and its demands were poles apart. A brief honeymoon, a separation filled with widely differing experiences, a return home, perhaps to a baby as well as a wife. Do such marriages last? The risk is probably high and the proportion of such marriages in the total of marriages in the early days of the war will doubtless be indicated by the higher divorce rate which occurs after war.

Children and War.—The effect of war upon the children cannot be measured. But we can at least consider to what they are subjected in wartime and stack those experiences against some of the essential needs of children.

In a world at war we have lived to a much greater extent than in normal times, under tensions, excitements, insecurity, unrest, anxieties, fears, sometimes sorrow—all experiences that may tend toward disintegration rather than integration. Many families have been uprooted, others broken. Mothers have had to carry on alone, pressed by anxiety for the husband at war or weighted with a burden of sorrow because he will not return. Children have changed their homes and their schools; they have missed their fathers—a great loss in many a child's life and during a war an experience that comes to more children than in peacetime.

There is no question but what the children have had to experience situations disturbing and abnormal but an inevitable element in the war picture. How can children feel secure in an insecure world, the insecurities of which cannot be hidden from them? How may we mitigate in so far as it is possible these insecurities? The answer seems to be found to a great extent in the adequacy of those in whose care the child is, and most favorable when the secure relationship with his mother is not broken. If the one caring for the child has the maturity and spiritual stability to bear the war experience well, we can have faith that the child will bear it well; if not, the promise for the child's stability is not good. Experience in the early war years in England indicated that separation from the mother, even if it took the young child away from the danger zones, was a questionable procedure in that it deprived him of that sense of security which comes from her love and his feeling of belonging.

The young child is necessarily somewhat less aware of the implications of war than the older child and his security comes largely from his mother. To the older child, and especially to the adolescent, the tensions of the actual war are a more serious

experience. Older children are more a part of the outside world and more deeply affected by it. The adolescent feels himself on the brink of the actual war itself. The excitement of it may even attract him; he changes his course in school because of the war; he goes to work, earning higher wages than the adolescent of a few years ago. He may break under the pressure; he may rise to greater endeavor and assume added responsibility because of it. Once more we find evidence of the importance of a stable home life.

FAMILY'S IMPORTANCE TODAY

ITS CONTRIBUTION TO THE DEVELOPMENT OF THE INDIVIDUAL

Shift in Emphasis As to Importance of Family.—As we consider the changes which have taken place in the family we cannot but realize a shift in emphasis as to its importance. Up to recent years, the family institution has in reality been supreme. Individuals have been sacrificed to the institution of the family. For example, the inheritance of the bulk of the property by the oldest son often meant sacrifice to the other members of the family. But the important thing was the carrying on of the family name, the perpetuation of the family as a social force, possibly as a political force, the maintaining of the family as an important economic unit. The family as a strong unit in society was the end, and that individuals might sometimes have to be sacrificed to that end was not then considered important.

In these days of emphasis on individual development, however, the family *per se* is not considered as important. If it is important it is important because of what it can do for the individual husbands and wives as well as children, and therefore it becomes a means and not an end in itself. The optimum growth of the individual is the end, and in so far as the family may be a means of promoting that growth it is good. In the days when the family was the important unit and not the individual, the patriarchal form of government seemed particularly fitted to promote the family institution. But in these days, when we are coming to what seems to be a more nearly adequate concept of the democratic philosophy, complete paternal authority can no longer exist.

The Emergence of the Democratic Form of Family Life.—We have already seen how the relationship between husband and wife has changed to a somewhat more democratic relationship. We find, too, evidences of a more democratic quality in the relation-

ship with children. The American family is sometimes accused of being so child-conscious that the child is said to be "spoiled" or to rule the "roost." Granted that that is sometimes, and possibly too often, true. Nevertheless the indications are that we are truly seeking to establish families on a more democratic basis. One hears reports of "Family Councils." Children learn something of the problems of running a home and a family by sharing with the parents in discussing the solutions. Children themselves have even been found to be more strict than the parents on the offending member, more willing to do without in days of economic stringency than the parents thought possible, an example of the sobering effect of a realization of responsibility.

It may seem somewhat absurd to think of the preschool child as taking part in family councils, but such has been the case in known instances. The little child, especially if there are older children in the family, has the experience of having parents and children talking things over and coming to a decision together. Even though taking no active part in the discussion, the pattern is set for him and he is being made ready for his later participation. It may be a discussion of how to carry through the job of putting the toys away at night without bothering mother about it, a matter in which the preschool child is to have a part. It may be a discussion as to the advisability of setting a sum of money aside for the music lessons of one child who seems to have talent, which would mean sacrifice on the part of the others. We could hardly expect the preschool child to voice an opinion on this subject since his concept of money values is not yet developed. Nevertheless the experience can add its bit to his understanding of family sharing.

Large Families No Longer Important for Sake of Family.—In the days when the family was all-important, the large family naturally was the rule, for it was then considered that the family must be powerful as a populating force as well as an economic force and must run no chance of weakening as a family because of lack of members. When the family itself ceases to be the end and becomes the means, it no longer has the same stimulus to populate the earth that it did have, and smaller families in which each individual is to be given his fair chance become the rule. The number of children in the family is no longer looked upon so universally as a matter entirely outside man's right of decision, dependent only upon the chances of nature. Instead, the claim is made that

it is right that the number of children in a family should, in so far as possible, be a matter of decision on the part of husband and wife.

Attitudes in Regard to Regulating Size of Family Important.—

It is coming to be felt that in mankind the sex impulse exists not only for the purpose of procreation, but also for the enriching of life in its social and spiritual aspects. Therefore it is coming to be felt that the gratification of the sex impulse may be sought not only for the purpose of perpetuating the species, but to serve a spiritual purpose as well. In other words, it places the sex act in man on a higher, not a lower plane than in animals when it conceives that it may be indulged in for other reasons than propagation. The modern viewpoint claims that children have the right to be wanted, the right to the fairer chance which regulating the size of the family to a number which can be adequately cared for would seem to give them, and that it is right to make use of scientific knowledge to limit the size of the family. Scientific knowledge is used to prolong life, to save life, or even to increase the size of the family, for it must be borne in mind that the problem for some people is not that of limiting the size of the family but of *having children*. Science has helped in this problem as well as in its opposite. It is in the *factors* which influence the decision of the husband and wife as to the size of their families that certain dangers lie. If those who seem to have a "goodly heritage" to pass on and who could give a child a good environment, choose for selfish reasons to have no children or to have only one or two, and if those who are less fit populate the earth, the outlook for civilization does not seem promising. Decisions made for selfish motives without willingness to make personal sacrifice for the sake of children, without an appreciation for the needs of the race and one's responsibility for the future, are the types of decisions which make one see dangers in giving information as to the methods to be used for limiting the size of the family. We need no help toward selfish living—we need every help toward socialized living.

The Prevalence of the Desire for Children Leads to Adoptions.—

However, as has already been said, most married people desire children. There is so constant a demand among childless couples for children whom they may adopt that agencies concerned with this matter often find it difficult to meet all the requests.

Practices in regard to the adoption of children have steadily improved in recent years as we have come to recognize the im-

portance of safeguarding all who are involved in the procedure—the child, the relinquishing parent (often an unmarried mother) and the adopting family. The state has set up definite regulations in regard to adoptions and social agencies exist as the safest channels through which successful adoptions may be made.

Family a Negation of Supreme Individualism.—As we stress the family's importance to the development of the individual it is well to remember that the word family has a plural concept and that we are desirous for the development of all the individuals within the family group. The family is indeed a negation of supreme individualism. Male and female are interdependent for the function of reproduction. Each can grow, think, carry on a business career separately, and die separately, but if the individual would have complete and normal sex expression and would react to the instinct for race preservation he or she is not a self-sufficient unit but must find a mate.

Man does not live to himself alone. He seeks companions, and if he would live successfully with others he must be able to so modify his individuality that it can fit into the group of other individuals without calling upon any one individual to make too great a sacrifice. Complete independence, if that means independence in all things, would seem to negate the possibility of the give and take of life which is such an important social experience. We need each other and life should be a supplemental experience. The family unit would seem to be the means whereby the individual can learn to fit into group living in such a way that he as well as the group profits by the experience. The family must allow freedom for personal development and yet must equip the individual with the brakes which respect for the rights of others, loyalty toward something outside himself, and love will put upon his actions. Such brakes need not be looked upon as devices whereby his individualism is inhibited, but as means which are under his own control and by which he may maintain himself in a normal state of growth thereby seeing himself in right relationship to others.

In the first few years of the child's life when parents seem to feel the weight of responsibility for his upbringing resting heavily upon their shoulders, the tendency has frequently been to depend largely on inhibitions. The word "don't" has appeared in a parent's vocabulary more often than "do," and without doubt we have seen some unfortunate results from these early suppressions. A little child's energies need to be directed into constructive channels

and the "dont's," though sometimes necessary, kept at a minimum. For example, his need for activity and noise must be met. Yet he can also learn that there is fun in quiet play and that the clock can tell mother and him when it is time for the baby in the downstairs apartment to take his nap.

Good manners come about more easily by helping a child in doing the socially acceptable thing, by setting the example and giving the opportunity for practicing good manners in a situation that is natural for the child. Insisting that he shake hands and say, "How do you do," to a somewhat formidable looking visitor or punishing him if he persists in his refusal usually brings only negative results.

In his play with other children which we wish to be as free and spontaneous as possible, he can nevertheless learn to "take turns" and to understand that cooperation in group play is important if it is to be happy for all.

Individual's Need of Family as a Socializing Force.—Myerson says: "Family life must be made up of at least two components, first, guidance and discipline, so as to bring into the child's life early the experience in customs and morals of his group, and secondly, freedom and individuality growth, so that his own natural tendencies in so far as they are good, may grow in order that he may learn to express his own will without too great a dominance on the part of his elders."* The family today in its finest expression is probably a finer achievement than ever before, for it is a group in which children guided by the mutual cooperation and understanding of *both* parents are allowed freedom for self-expression and yet are given the opportunity to learn those lessons in human relationships which make for satisfactory living with others, lessons which the family group seems to be especially qualified to give.

When the desire for self-expression on the part of one clashes with the desire for expression on the part of another, trouble will ensue until those individuals have learned something of justice, of respect for the rights of others, of kindness, sympathy, and understanding, and by learning have found satisfaction in the give as well as the take of life. Such lessons, one finds, children may begin to learn in babyhood from the intimate family circle in which they have lived the first months and years of their lives. The impressionable child, sensitized by the love element found as an

*Myerson, Abraham²⁶² (p. 131).

essential part of the environment in wholesome family life, acquires many things through the example set by those around him, possibly a characteristic gesture of hand or head, and equally possibly such fundamental attitudes as those toward himself, his God, and his fellowmen which may become part of him for life. It is easy to lay certain traits in children to heredity; it is much less easy to face the fact that one's own daily example may be the cause of the child's attitude toward food or his selfishness with his playmates or his rebellion against authority. May not the thoughtless but scathing criticism uttered within the family circle of a neighbor who is met with honeyed and flattering words be an easy lesson in insincerity and intolerance which bears its mark in later life? Are religious and race prejudices inherent in the individual, or are they rather handed down from generation to generation not as a biological inheritance but as an attitude acquired in early life by imitation of some member of the family? No other institution is as great a pattern-maker as the family. At no time in life is the child as sensitive to the pattern set as in the preschool years.

Family Influence on the Religious Life of the Individual.—Man has always sought the security of establishing his relationship to the Source of all life, God. There are many definitions of religion, perhaps an indication of the universality of this seeking, but inherent in them all is this concept of an Ultimate Reality which can give to us the meaning and value of life and therefore an incentive to behavior at the highest level, a goal toward which to strive.

The paths man has followed in his search have differed but the search has been universal and the tendency for those who believe they have found the way to Truth has naturally been to organize in groups, to follow the path together, and possibly to draw others into the same path. Hence, there has arisen organized religion with its many different emphases and doctrines all having, however, the one thing in common, the search for God.

Families have been identified with one organized religion or another. They have felt so strongly that one special path was right that individuals have accepted ridicule, persecution, banishment and even death rather than to be disloyal to what they believed to be Truth. Whatever one may think of the validity of their beliefs we have a glorious heritage in the courage and strength they have shown in clinging to what they thought was right.

The children of families adhering to one faith or another, especially in the early days, followed in the footsteps of their parents. Religion and especially indoctrination with a special form of belief was a family responsibility. Organized religion gave its aid and admonition as to what the child should be taught, but the child's first religious experience came early, and within the family. The Sunday School of the Protestant Churches, for example is a comparatively late development in church history.

Organized religion would seem to have lost some of its hold on the families in this country today. In the United States the children are having less religious training than formerly. If children are indeed being deprived of an opportunity for the spiritual development which comes through finding their relationship to God they are being badly handicapped in their development. But the "quest of the ages" cannot be stopped even in a period when many have broken with organized religion as it exists today and are perhaps at a low spiritual level. Man feels the constant urge to find God and he will seek Him.

Certain attitudes of a religious nature will inevitably come to the child through the attitudes expressed by his family and they may be truly spiritual in spite of a break with the church or temple. But whether parents have identified themselves with organized religion or not, to many of them the problem of attempting to give their little children some understanding of God becomes a real one. Children at a very early age inevitably ask questions which show their eagerness to understand the meaning of life, the where-from and the wherefor. How may those questions be answered in such a way that a sure foundation may be laid for the child's spiritual growth, for his understanding of his relationship with God?

We are justified in saying, first, that the parent who has no sense of sureness as to his own relationship with God cannot pass it on to his child. We are also justified in saying that the answers which the parent gives to these all-important questions which children ask, must have the ring of sincerity. They must be true in so far as the parent understands Truth. If the parent honestly believes that the world was created in six days in the literal sense, he will give that answer to the child's question, and even though the child may come to question that answer at some future date, we may still believe that it will not result in a loss of faith in his

parent's integrity but rather in a question as to his parent's knowledge. The surmise that one's parent is not all-knowing is less disturbing to a child than the experience of discovering that his parent is not basically honest with him.

It is important also to answer children's questions as nearly as possible at the child's level of understanding. It is true that children are constantly exposed to language and ideas beyond the level of their understanding and through that exposure their growth in understanding grows. But when we are faced with their questions we must give them answers which have meaning to them. If through some of our educational experiences we no longer accept a literal interpretation of the incomparable first chapter of Genesis, we may nevertheless still be able to give the simple and satisfying answer to the child, "God made the world." The answer to the "how" question often following close on the heels of the "who" question may be somewhat colored by some of our college courses, but even so we will not answer at the level of a college student's understanding. The parent at this point may choose to read the vivid and majestic story of Genesis I with the comment that "a long time ago people told this story about how God made the world" or the decision may be to try to give in one's own words a picture of the evolutionary process. Whatever one's decision as to the answer, one should be guided by the desire to satisfy and not confuse the child. "I do not know just how it was done" is less confusing to a child than an involved answer which is beyond his comprehension.

Undesirable Family Life a Factor in Juvenile Delinquency.—As we stress the importance of family life in the development of the individual we cannot ignore the fact that unfortunately all the lessons learned from the family may not be, in fact often are not, desirable lessons. The child may have lived in a family where such virtues as kindness, tolerance, respect and loyalty have not been practiced. The child may have had the cruel experience of being unwanted, unloved. Should we wonder that children having such experiences reflect their emotional tensions and insecurity in their behavior? Indeed one may find even in the two-year-old child the beginning of a ruthlessness and a disregard for the rights of others which does not augur well for satisfactory social well-being. Reports on studies of juvenile delinquents and unmarried mothers bear out one's belief in the importance of the family in the development of the child. There one gets the adverse side of

the picture and finds bad home conditions in a high percentage of cases as a factor influencing behavior. Healy and Bronner found that "among 2000 young repeated offenders there were living under reasonably good conditions for the upbringing of a child, only 7.6 per cent Where to place a large measure of responsibility, where to direct a strong attack in treatment and for prevention of delinquency stands out with striking clearness."*

The Children's Bureau, in a study of illegitimacy, states: "Conditions in the mothers' parental homes were far from desirable, for in only 21 per cent of the cases in which information was given on this point were the mothers' parents of good character, normal mentality, and normal status, both parents present in the home." It states further, "Especially has it been shown that most of them lacked normal homes, of the type in which wise parents share their children's lives and experiences and guide them tactfully into proper activities."

Increase in Juvenile Delinquency Because of War.—A poor type of family life with its insecurities and inadequacies seems obviously to be a predisposing factor in juvenile delinquency. Impose the tensions of war and especially the destructive element in war upon such families and is it not almost inevitable that the children, those sensitive indices of environmental conditions, should break under the impact and that we should have an increase in juvenile delinquency during the war years? The children at the ages when delinquency occurs have not only to meet the insecurities within the family, but they cannot escape the insecurities in the larger scene. Newspapers, radios, movies, the increased feeling of hate and desire for violence expressed by the public toward the enemy all bring this sense of insecurity within their ken. It is in the very air they breathe albeit children in the United States have mercifully escaped the dangers and tragedies which the children of other countries have endured. Do we go to war to save our children's future and in the very act destroy them? Certainly juvenile delinquency with its unpromising forecast for the future is made increasingly serious because of the war.

If the family is therefore so important a factor in the child's life it is well to think of how it may help the child to grow satisfactorily toward integrated maturity, for one would hardly deny that the opportunity for satisfactory growth is the opportunity which we would wish to give children. The family provides the

*Healy and Bronner¹⁶⁵ (p. 129).

setting for the child in whole or in part during the growing and impressionable years and will to a great extent be the predominating factor in the developing personality.

REQUISITES FOR SATISFACTORY FAMILY LIFE

The Importance of Marriage as a Basis.—From the viewpoint of the child, and it is from that viewpoint that we are regarding the family institution today when we are thinking of it as a means for fostering individual growth, the question of marriage becomes a very important matter. The institution of marriage is going through a transition even as the institution of the family. The original meaning of marriage is found in the family, that is, in the parent-child relationship; but we are far removed in time and concept from the origin of marriage, and there is no reason to expect that, while man has developed through the ages, marriage should have remained an unchanged institution. It must needs change to keep pace with man's development. Marriage which is basically an individual matter eventually becomes the concern of the family group, the church and state, the last two setting up certain regulations in regard to it and decreeing that it should take place before the founding of the family if the child is to have recognition as a member of the family. Man has made of marriage a social and spiritual matter through which he has sought to satisfy something far beyond a biological need. Marriage today will not be undertaken for the same reasons that it was undertaken in primitive society. It has taken on new meanings and must be judged in a different light.

The marriage of today which is undertaken by two individuals for their own personal desires because of a mutual attraction—love, desire for companionship and delight in each other—perhaps with the definite understanding that there will be no children at least for some time, that the wife will pursue her chosen business or professional life as formerly, is far removed from marriage as understood under the rigid patriarchal system of family life. One might contend that there are not the same reasons for permanency or for the support of wife by husband in marriage today as there were in an earlier culture when woman had little or no economic value outside her own home, when a childless marriage was considered practically intolerable and the wife's whole responsibility was the care of her home and children.

The Requirements of Marriage Today.—The demand is made of marriage today that it shall be mutually satisfying to the husband and wife whether they be parents or not. Although divorce is almost twice as frequent in childless homes as among families that have children, the evidence in Terman's³⁶⁴ study is that the presence or absence of children "has little effect on the general level of marital happiness." Burgess and Cottrell say: "The presence or absence of children, or their number, may not be so significant as the *attitude* of the married couple toward having children. . . . These findings regarding attitudes toward having children showed a more marked relationship to marital adjustment than any other item included in our study. It is evident that the child is a potent and vital factor in family life. If companionate marriage be defined as a marital union where children are neither present nor desired, it is one which on the average grades very low in marital happiness. Only those unfortunate marriages that produce unwanted children reach a lower level of marital maladjustment."* The demand is also made of marriage that if the husband and wife are parents there shall be other satisfactions as well as the satisfaction of parenthood. In the days when the family was considered the important institution which individuals worked to serve rather than to be served by, families arranged marriages, having in mind the good of the family rather than of the individual. But when the individual began to come out from under complete family domination, both man and woman demanded the right to make their own decision or choice as to a mate. Family needs affected them less and personal desires more.

The Need for Preparation for Individual Choice.—The right of a responsible individual to choose one who, it is hoped, shall be a life partner is hardly questioned in this day and generation. But it is equally evident that individuals should be given some preparation, some standards for choice which may possibly save them from rushing into a marriage with someone for whom they feel a temporary attraction and with whom there is little chance for forming a successful partnership for their own satisfaction or for the rearing of children. As the right of individual choice in marriage developed in our culture, and family decision on the matter waned, the ideal of romantic love as the guide strengthened. The family (represented by the older members), guided by experi-

*Burgess and Cottrell⁶⁰ (p. 260f).

ence and motivated by the desire to strengthen the family in some way, took into consideration such realistic questions as economic stability, similarity of background and social status, health especially as it might relate to childbearing ability, and other matters of an equally practical nature. But when the individual stepped into the picture and demanded the right to choose, such considerations were scorned. To be "in love" was all that mattered and there was no attempt to break down into its component parts and examine the matter of being "in love." Yet our common language seems to indicate a quality in it that might suggest the need for "sweet reasonableness"—*e.g.*, he "falls in love," is "crazy about" a person, "madly in love." Is it possible that some of the increase in our divorce rate is due to the fact that for a time at least we discarded the family custom of looking realistically at the proposed marriage?

The scholar has begun to look at marriage with a scientific scrutiny, trying, for example, to understand it and what contributes to its success or failure. Two studies of importance have been reported in recent years which throw light on this question of marriage, *i.e.*, "Psychological Factors in Marital Happiness," by Lewis M. Terman and "Predicting Success or Failure in Marriage," by Ernest W. Burgess and Leonard S. Cottrell, Jr. What the scholar learns which has so direct a bearing on everyday living will not remain hidden between book covers to be read by a few but will come to the attention of those who take part in everyday living. One dares to predict that complete reliance on the romantic approach to marriage will be tempered by what may be called a realistically romantic approach. The growing interest in the subject of marriage as something to be studied is evidenced in our colleges today and is an indication that such a prediction is warranted.

The question arises: If we have some understanding as to the factors which make for happy marriage, can we do something to insure a greater number of successes in marriage; can we in any way prepare for marriage so that it may in truth become a sacrament?

Marriages which are successful do not end in divorce, for divorce is an acknowledgment of failure. Anything that is done to make marriage a success will therefore reduce the number of divorces. It is interesting to note that the usual attitude of any one starting upon a life career is that he is determined to make a

success of it. Failure in it is likely to be considered something of a disgrace, and one hesitates to acknowledge failure in a career until one has made a mighty effort to achieve success. One does not find the same attitude prevalent toward the career of marriage. Groves¹⁴⁷ says, "It has become characteristic of our time not only to enter marriage under the spell of pleasure motives, but also to retreat from it just as soon as it ceases to advance happiness." This attitude toward marriage is an inevitable result of the claim on the part of the individual for a right to happiness, without a realization of the individual's responsibility to attain that happiness through his own striving toward a goal. There is today little if any feeling of disgrace when one has failed in marriage. Divorce is not the disgrace it used to be considered. One may call it a frank acknowledgment of failure. The disgrace lies rather in the fact that two grown people who, in this age, are supposed to have received at least a fair amount of education, have entered upon marriage without preparation or without having had developed within them an attitude toward marriage which would insure a chance, at least, of success.

The Necessity for Standards and Effort to Make Marriage a Success.—Marriage is such an intimate affair, so dependent for success on the adjustment sexually, emotionally, intellectually, and, one may also say, practically (for everyday living together assumes a very practical and oftentimes humdrum aspect), that it is not necessarily an easy matter to attain success. Certainly success will not be obtained without the will to succeed and definite striving for it. It is well to remember, however, that success through *effort* is the most satisfying form of success and that there are many successful marriages today in spite of the fact of our increased divorce rate.

Are these successful marriages to be just lucky chances or can we in some way insure more successes? It rests with the individuals. To be emotionally and sexually compatible, to supplement each other, and to be a stimulus to each other so that each one reaches a higher level of development because of marriage, to find with each other the satisfying companionship which means that pleasures are enhanced and burdens lightened by sharing them, all these make marriage a rich and lasting experience. It would seem, then, that a marriage based upon a love which had in it not only mutual attraction and sex urge but also elements of unselfishness and willingness to adapt to another as well as ele-

ments which make for truly satisfactory companionship, had in it those elements which modern marriage requires. The purely romantic idea of marriage to which so many people have been exposed has not been a sound social basis upon which to build, since it presents marriage as a rosy state of love and happiness to be embarked upon without any thought of the effort which each partner must make to insure success or of the change which each will inevitably undergo.

If, in addition to the mutual satisfaction found in each other, the husband and wife desire children and are prepared to assume an intelligent responsibility toward helping those children obtain satisfactory growth, we have a marriage which has laid the cornerstone for successful family life. But what of the individuals who may possibly attain this success? How can they become the type of individual for whom success will be possible? Both the Terman and the Burgess and Cottrell studies point toward the importance of the childhood home. The happiness of parents, the affectional bond between parents and children, the lack of conflict, the happiness of the children, discipline that was firm but not harsh are found important by one or both of these studies, and once again we find proof of the importance of the family in the life of the individual.

The permutations and combinations that *may* be made and yet accomplish a satisfying husband-wife relationship cannot be stated and are probably countless. Although we classify people as to types, every individual differs somewhat from every other individual and no one exactly corresponds to the type as described in textbooks, for example. The process of adjustment to each other will differ in every case. The dominant and submissive may carry on happily, on the other hand there may be an underlying friction which increases with time, ultimately leading to a break. The dominant may be happily or unhappily married; those of widely varying cultural backgrounds likewise. But studies will give us "leads" as to probability and today the young people considering marriage have the opportunity for greater understanding of the areas wherein they may find difficulty and greater insight for the resolution of those difficulties.

Granted that the cornerstone for successful family life has been laid by a satisfactory marriage between satisfactory individuals whom we might expect to be satisfactory parents, what then should be provided as the physical and economic setting for the

child in order that he may have the opportunity we desire for him? What are the family relationships which we would wish to establish for the child?

Physical Requirements for the Home.—The economic condition must necessarily impose limitations on the physical setting, but there are certain fundamental physical requisites which must be provided in one way or another in the child's environment if he is to be given his rightful opportunity. Physicians and psychologists tell us that we all, and children especially, need sunshine, fresh air, rest, sleep and exercise. The right kind of food, which includes a safe milk supply and a pure water supply, and a satisfactory system of sanitation and protection against disease should be provided, not only for physical well-being, but also for emotional and social well-being.

Some of these the community, in reality largely an aggregation of families and therefore with a family consciousness, provides. One finds that within this century especially, through various public health measures, more and more communities have secured for themselves proper sanitary conditions, a safe milk and food supply, a pure water supply and protection against the spread of communicable diseases. All have shared in these benefits. There are still other physical requisites, however, which are left to the individual family to provide, and it depends on the intelligence and economic condition of the family as to the extent to which they will be provided. The responsibility belongs primarily to the parents. They will choose their home, their milkman, and the food they are to eat; they may choose intelligently with thought for the physical needs of the children, or blindly without due consideration for these needs, being blind often not because they choose to be blind, but because they have not had their eyes opened. Marked changes have taken place in regard to the information available to parents today especially in regard to physical well-being, and the results are seen in a growing body of healthy well-nourished children. Much still needs to be done but we know more of the way we should take than we did two or even one generation ago. If the community insures good sanitary conditions and a pure water supply, the parents will not have a responsibility in regard to them, beyond assuring themselves that these essentials are provided.

Shelter.—The economic condition, the place of business of the important earning member of the family, and the educational

and social opportunities in the neighborhood necessarily influence and limit the choice of location of the home. That the family must have shelter is so obvious that one hardly remembers to say it, but there are various kinds of shelter and far too many of a substandard nature. Carol Aronovici says in the Introduction to "Housing the Masses" (p. xiv), "We have in this country, allegedly about 10,000,000 families living in substandard dwellings," a fact which demands the serious thought of all those who are concerned with the question of family life. For how can we hope to promote satisfactory growth and development either for the child or the family if the shelter is inadequate and degrading? But granted that the individual had some power of choice, what should one think of in choosing shelter for a child? There is the single house, the double house and the multiple dwelling, which varies from the two-family house to that hive of families, the apartment hotel on the one hand for those with greater economic freedom, or the large tenement house of our city slums for those who have little to spend on shelter. Apartment houses are too numerous today to rule out children, and the problem now is to try to meet the needs of children in apartment houses, a subject which deserves serious consideration on the part of families as well as real estate owners. The Federal housing projects of the last few years have given consideration not only to the social and activity needs of children but also to some of the social needs of adults, and we should look for further improvement in these matters.

Meeting Children's Needs.—Let us keep in mind what children need—sunshine, fresh air, rest, sleep, exercise, etc. For exercise we must have space, outdoors certainly, indoors to some extent at least. The single house, set in an ample yard, obviously offers sufficient play space. It would usually, too, offer more opportunities for sunshine. But neither the double house nor the apartment, not even the tenement house, should necessarily prohibit these things. Small playgrounds within easy distance of tenement houses, roofs made safe for children, balconies, a small back yard, a window into which the sun streams part of each day, may be means by which the requisites of space or sunshine are provided. Apartment houses without elevators make it very difficult for a mother on an upper floor to take her baby in the street in a baby carriage, but a balcony or even a room where the window may be kept open and through which the sun streams may provide the essentials for the infant whose need for space is not so

great as the child who has begun to explore the world on his own two feet. For him there must be space for real exercise, if his need and desire for activity is not to get on the family's nerves and thereby create a behavior problem. The important thing is to keep the essentials in mind and use one's ingenuity in providing them in one way or another.

Space.—Space has another value besides providing the child with exercise. People do not find it easy to live successfully together if they are in continuous and close proximity. "The world is too much with us" is often true, and that individuals, especially certain types of individuals, need a certain amount of solitariness and quiet is generally conceded. This brings up the question of the number of rooms in the house, a matter which also depends largely on finances, although perhaps not so much as one might think. For the urban dweller, the small apartment with many modern conveniences, with an impressive entrance hall, and located in a certain desirable street may look more inviting than the larger apartment on a side street, and without all the extra conveniences; but the extra room or two are assets which must not be lightly discarded if they promise to fill some of the essential needs of the family rather than what is in reality a non-essential desire. Additional rooms give more air space, more chance for quiet, more chance for the children to have space which is their own where they may keep their own things and play their own games without running the risk of hearing frequent complaints because they are underfoot. Children, however, should not be banished from the family rooms and the social experiences they offer. Through experience in the living room one may learn not only something of the amenities of life but also something of concern for polished table tops and the fragility of objets d'art. The little child who passes the cookies to "mother's" guests is having a happy experience which helps in his acquirement of social ease, physical dexterity, and possibly of some restraints if sugar lumps are a great temptation and only one is his allowance.

The family is made up of adults and children and the needs of the two are in many respects different. They are, nevertheless, needs, and the problem often becomes one of adjusting to meet the needs of one without sacrificing the needs of the other. The house is built for adults, the furniture and equipment are for adults, but children live in that house and their needs must be

considered. A respect for furniture and walls is not inherent in children, and although it should be developed, a child misses something very important out of life if there are no chairs which he is allowed to tip over to make a train or to set up a house or tent by covering with an old blanket. Imaginative play is too important in a child's life to deprive him of it in his home. Yet the adult's needs must not be ignored. The mother who is in need of rest because of an unusually heavy burden that has been placed on her must be relieved from too close proximity to the play of eager little boys who become for the time being various kinds of airplanes traveling from city to city over land and sea. Space is indeed an asset to family life that must not be overlooked.

The tendency is to think in terms of the urban dweller in these days of large cities and a drift away from the country where space is easily available, but where other important needs may be less easily met. But many of our American families are living in suburbs, small towns or isolated rural communities. Each type of community has its definite characteristics, its assets and its liabilities which parents may evaluate and supplement as they intelligently consider the needs of childhood.

Space for the Child's Things.—The home should also provide space for the child's things. Whether it be but a corner of a room or a lower drawer or shelf somewhere in the house, there should be some space within reach of the child's arms which is the child's own for his own things. Not only must the place be provided, but it must also be respected and free from intrusion. His things, no matter how absurd they may seem in the eyes of the unimaginative adult, should not be ruthlessly cleared out, although it sometimes is necessary to teach the child that he cannot keep in his bureau drawer the "dear little dead mouse" he has found. Individual possessions and provision in the house for keeping these possessions in order make not only for a clear-cut sense of property, but also for habits of neatness. If, for example, there has never been a hook within the child's reach, it is hardly to be expected that he will acquire the habit of hanging up his coat. No things of his own, no space for his own things, make for difficulties in learning important lessons in life, such as neatness, respect for property, and respect for the rights of others.

The Factor of Noise.—The matter of undue noise is another matter for consideration in choosing a home, especially in the city. Whether or not it has a permanently deleterious effect on the

nervous system, the constant bombardment of certain types of noise seems to increase a tension which may end in an emotional outburst that brings stress and strain into the family situation. It may seem wiser on that account to take a house a block away from the noisy car line even though it seems less convenient. The chance for the children themselves to make a noise is another factor that must be considered. That "children should be seen and not heard" is no longer accepted as a maxim which should guide us in our training of children. Children are bound to be heard; it is right that they should make a noise, and children's noise, though it cannot be allowed to run riot, must be provided for in some way at some time in each day without becoming a source of irritation to the individual family or the nearby neighbors in the apartment. Fear of annoying the neighbors or of what they will say too often affects a mother's attitude toward her child. It is important to remember that a child must not be allowed to learn that he can get what he wants by crying because the thin walls in the apartment make his mother fearful of annoying her adjoining neighbors. Better to move out of the apartment.

The Equipment of the Home as an Aid in Forming Desirable Habits.—As has been said, houses are built for adults and to a great extent are equipped and furnished for adults. But children are born into those houses and are to live in them. The home should provide for the child's physical needs but it should do more than that. It should be a help rather than a hindrance in forming desirable habits. A child, for example, can hardly be expected to form the habit of clean hands before meals and of using his own towel if washing before dinner is either a matter of a hurried wash at the high kitchen sink at the hands of some grown-up when he comes in from play, or if the washing entails a long trip upstairs to a bathroom where nothing fits his size. Small toilets and bowls are expensive and though enticing are not essential. The thing which is essential if one would have children acquire the habit of cleanliness is to provide some way so that children may easily learn to wash themselves, reach their own towels, face cloths and tooth brushes. It can be done if there are low hooks or racks, a chair or box to reach the high bowl, or a separate basin which can be set on a low stool. If the home is a house rather than an apartment, some arrangement for a downstairs toilet and wash basin and a place for hanging the outdoor things will help the child in forming desirable habits of neatness,

cleanliness, and responsibility about elimination. The child busy and absorbed in his outdoor play puts off going to the toilet until too late if that toilet is away upstairs and muddy feet must not be tracked through the hall.

Tables and chairs which will make the child comfortable rather than uncomfortable at meals facilitate in the development of good eating habits.

Equipment that makes "helping mother" in household tasks pleasurable and within the realm of possibility is well worth having not only because it helps in the development of good habits but because "mother" will actually be helped.

The preschool child has the skill and the strength to help in many ways, ways which might be decided upon at the Family Council. He can empty waste baskets and ash trays. He can assist in wiping some of the dishes, first the unbreakables and then some of the more easily handled and fairly sturdy breakables. He can wield a small mop or broom. One will not expect a performance that is equal to the adult's. But the child is learning to share, to acquire skills and standards, and such learning at an early age far outweighs any inadequacies in the results he achieves. The wise mother neither calls the performance perfect which is not perfect nor does over again what the child has done with such good will and effort, a discouraging experience for a little child to have. A good example set, increasing skill and pleasure in the doing of the task should eventually bring about the adequate performance.

The "grown up" bed instead of the crib may actually serve in promoting growth in self-reliance. "Things" which are not too precious in the eyes of the mother so that she may be able to bear with serenity some possibly inevitable destruction or marring may well be used for a few years instead of the more highly valued.

Equipment of the home is indeed a factor in promoting the "growth and development of the young child" and parents can show much wisdom in purchasing equipment with this fact in mind.

The Effect of the Economic Factor in Family Life.—The economic factor in family life is an extremely important factor to be considered. Although family life may be successful in its main elements, it cannot be denied that poverty and wealth inject certain difficulties into the family situation that sometimes are a predisposing factor to the family breakdown.

An income so small that it has no amount to allot to that essen-

tial, recreation (which is in truth re-creation) or which allows no margin for meeting the emergency of sickness or for saving, puts upon those responsible for the care of the children, especially if they are carrying that responsibility conscientiously, a burden which is difficult to bear without worry. Worry means a stress or strain which makes for tension and thereby destroys a certain serenity important to family life. A sense of insecurity is difficult for adults as well as children, and a sense of insecurity about the money which is to provide some of the children's needs is indeed difficult for parents. One must not forget, however, that wise planning and an ability to differentiate between the essentials and the nonessentials of life can do much to alleviate some of the difficulties of maintaining a satisfactory family life on a limited income. There are indeed certain values to be gained from life in a family where there must be careful counting of the pennies. A spirit of cooperation, of helpfulness, a self-reliance, a willingness to do without, a willingness to give up in order that some one else may have, are more easily fostered in the home where the income seems to need stretching than in the home where the economic situation is such that these traits are not naturally required. The difficulties of having too little are obvious, and are often very great when the discrepancy between income and standards of taste and living is wide, but the dangers of having too much are, though less obvious, nevertheless important. The home in which there is plenty of service, perhaps fortunately not so easily obtainable these days, the home in which it is economically easy to provide the child with everything that he needs, must watch out lest the child has no chance to learn to wait on himself and lest he come to overestimate the importance of self because not only is his every need supplied but his every desire is gratified. Then, too, it becomes difficult to learn to differentiate between the essentials and the nonessentials of life when one is not called upon to decide upon what one must do without because of the money involved.

It is not possible to translate the term "sufficient income" into dollars and cents, for many factors enter into the decision. Time and place, the cost of living, and standards of living (a product itself of many different conditions) make "sufficient income" almost an individual matter. The children must be sheltered, clothed, fed, protected against disease, cared for if sickness occurs, and educated to meet life as successfully (not used in the material sense) as possible; but so varied are the individual inter-

pretations as to how this should be done that it makes a definite statement impossible.

We might speak at this point of the preschool child's relationship to the economic factor of family life. As already stated he has no real sense of money values since at five years of age we hardly expect him to have a reliable number concept of more than three or four articles. Yet he has doubtless had trips to the store and knows that money buys things and that a penny is money. He is *beginning* to learn, which can be said so often of the "under-five" child since there are so many beginnings in these first five years. He has a penny to spend and learns that one penny will not buy the coveted article but perhaps two or three pennies will. He has not enough money; he needs more money. He may often have the experience of getting more money for the asking, or a mother may perhaps think that this offers an excellent opportunity for him to begin his learning about earning money. We do not want to pay a child for all the household tasks he shares in, but there may be special things for which a little child may receive his two or three pennies and thereby have his first experiences in earning.

The Establishment of the Family Group.—In discussing the physical requisites of the home, its equipment and the effect of the amount in the family pocketbook on our decisions in regard to them, we have presupposed the normal family group in which there is a child or children, for we hope to find in the family not only the husband-wife and parent-child relationship but also the child-child relationship. One might note at this point that until there is a family of four children and that evenly divided between the sexes, we cannot have all the sibling relationships. Might that possibly be a good reason for looking with favor on a family of at least four children?

Granted that a satisfying marriage is in the making, a happy husband-wife relationship "a'growing," we come then to the time when husband and wife will become parents, when a baby will be born whose nurture will be their joint responsibility and concern during the years of dependency. Born a so-called helpless infant, he must be cared for and guided toward true maturity. We say "helpless infant" but we must remind ourselves that that is only a relative term. He has his own independencies from birth and even before birth. His mother thankfully feels his first kick "in utero"!

Harmonizing the Husband-Wife Relationship and the Parent-Child Relationship.—Nevertheless infancy is a period of great dependency and the new parents' first experiences with the child must of necessity impress this fact upon them. Often in this dependency they find a source of satisfaction; the loved object needs them and they delight in serving. True, as the months go by there may come times when the urges to be something other than parents exert strong pulls, especially if the care of the baby seems to preclude the possibility of the parents' participating in a life together outside the home. Tensions, too, may arise because the mother-function becomes so all-absorbing that the husband feels excluded or because the mother, deciding that the baby requires that she stay at home, sends her husband out for evening recreation without her and then feels neglected because she is alone. As one learns to function in this new capacity as a parent one needs to remember the importance of harmonizing this new function with the husband-wife relationship.

Right Relationship within Family Important for Growth and Development.—The satisfactions found in protecting the child during the early dependent years sometimes lead parents, and especially the mother, into unconsciously rebelling against letting the child "grow up." It is difficult to "let go" wisely and at the right time, but it must be done if we are to achieve the individual development which is our goal.

To establish a relationship between parent and child that will aid the growing up process must necessarily permeate a book on growth and development and cannot be relegated to any one section or chapter. It is an essential aspect of the harmonious family group as is the husband-wife relationship and, one is inclined to say, also the sibling relationship. The only child must seek the child-child relationship outside the home and this can never offer all the values of the sibling relationship. Nor do the parents of an only child have the rich experience of knowing, learning to understand and seeing with the loving eyes of parents, children of widely varying characteristics. These relationships will be developed further in Chapter X.

Goals of Growth and Development Obtainable in Spite of Liabilities.—This goal of growth and development for the individual is not reached by one path but by many different paths. Each family has certain assets and certain liabilities. Some of the lia-

bilities are not inevitable but may be done away with, perhaps by a change in attitude on the part of the parents, but some of them must undoubtedly be met and compensated for in one way or another. For example, the chronic illness, possibly of an elderly relative in the family, seems in many ways a distinct liability in family life, making a certain amount of play and noise impossible, tending perhaps to inject an element of repression into the situation. Yet that very situation has in it the possibility of giving children invaluable opportunities to learn the lessons of thoughtfulness and consideration for others, as well as a self-reliance which comes from learning that even though little, one can share in the care of one who is old. The human body has a tremendous power of compensation in the physical realm. It learns to adjust itself sometimes to almost unbelievably difficult handicaps, and it would seem as if this principle were true in regard to other aspects of life as well. One would not deliberately set up economic, physical, or social handicaps for any child, but if they do occur one must not consider them necessarily overwhelming, dooming the child to what the condition seems to indicate. There may be inherent in the very challenge of difficult situations compensations worthy of consideration and the liabilities may indeed become assets.

Many Types of Human Relationships Found in Family Group.—

The term, human-relationships, has appeared in common parlance as well as in print in these last few years, indicating in many ways that we recognize as never before what a potent factor it is in life. Colleges give courses in Human Relationships, labor, business, industries give heed to its importance. We find Personnel Departments, we find Counselling Services, we find constant evidence that the human equation tips the scale toward success or failure in almost every aspect of life and that we are seeking means whereby we may better our relationships with our fellowmen. The world shrinks in size, is hardly more than the village of colonial days as far as facility of contact is concerned and men *must* learn to live as brothers if we are to survive. In the last analysis the idealistic seems indeed to be the far-sighted realistic point of view.

The family is in many ways the counterpart of society. Many types of relationships exist in family life. In the intimate life of those who are sharing life under one roof one may learn to live with those of all ages, of the same sex and of the opposite sex, of

a sympathetic point of view and of an unsympathetic point of view. Within the family one may run the gamut of almost every experience which life offers. Constant association necessarily brings its irritations as well as its satisfactions and the lesson of meeting irritations with success is a lesson that is an important one to learn. Constant association also gives one an opportunity to get another's point of view, to learn to read between the lines of action and to know that what seems like unaccountable behavior may be but the cloak to hide an emotion which others do not suspect. The intimate experiences of family life, especially if one has the rich experience of living with many personalities, are experiences which reveal much as to the causes of human behavior if one's eyes are open. Brothers and sisters, parents and children, guests of the family, possibly grandparents and children, boarders and children, servants and children, each situation offers opportunities for children to learn how to live with people in such a way as to benefit themselves and other people. We live in a world of people like and unlike and until we learn how to do this successfully, beginning these lessons in the family, there can be no peace.

SUGGESTED QUESTIONS FOR CLASS DISCUSSION

1. Consider some of the families with which you have been familiar and with reference to the preceding chapters what indications do you find: (a) of the patriarchal type of family? (b) of a growth in a democratic philosophy of family life?
2. Discuss the shifting emphasis on the importance of family life. What values do you see in this change?
3. Discuss the changes in the status of woman. What effect have these changes had on family life?
4. Consider the question of the wife and mother working outside the home. If liabilities in the situation, what may they be and how met? What may the assets be?
5. What may the effects of the war be on family life?
6. What do you think the role of the family should be in the religious life of the child?
7. What are some of the important points which the husband and wife should consider in providing a home for their children?
8. Discuss some of the values you see in family life which should further satisfactory growth and development in the preschool years.

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Life Begins

PRECONCEPTIONAL PREPARATION

"The coming of a baby is not a segment of life, but life itself. It cannot be studied apart from the sum total of living."* Giving being to a new life is life at its richest and fullest, contentment at its deepest and in the truest sense, "life itself," as attested by millions. As this most complete of all life's fulfillments cannot be "studied apart from the sum total of living," so it cannot be adequately prepared for except as the preparation embraces all of life.

For a long time medical and, more recently, social sciences have directed much thought, time and effort towards the care of the pregnant woman for the purpose of assuring her and her newborn child greater safety and better health. Figures for maternal and infant mortality and morbidity have steadily decreased in the presence of good obstetric and pediatric care. Still for a few mothers, what should be a normal physiologic process to be experienced joyously with even increased buoyancy of health, has instead proven to be a period of complications and ill health. For this reason there is an increasing emphasis upon premarital and preconceptional care. "Preconceptional care," writes a distinguished obstetrician, "consists of eugenic and euthenic preparation for marriage and reproduction. It includes proper growth and development from birth to maturity in all its phases. It is an essential factor in the elimination of disease and in the continuation and improvement of the human race."†

Inheritance.—No one has any part in the choice of his own ancestors but each prospective parent in the choice of a mate owes some thought to the selection of ancestors for his unborn children and grandchildren. It is an established fact that inheritance is passed on by both parents to the child at his conception,

*Corbin⁸² (p. 169).

†Adair² (p. 734).

and once the sperm cell meets and penetrates the ovum and the latter is fertilized, inheritance is unalterably fixed, and neither quantity nor quality of environment can in any way change it. The vital import of inheritance to the total life span of the new individual is too well known to need amplification here. The recently discovered and much publicized Rh factor of the blood emphasizes the fact that there must be careful choice of one's mate or, with respect to this blood factor at least, "nurture" in the mother's uterus may be so inimical to the "nature" of the offspring as to make life itself impossible.

Preconceptional Health of the Mother.—The growth and development of the mother is important in all its phases. That mother whose pelvis is free from rickets or other bone deformity is much more likely to go through a normal uncomplicated delivery. If she comes to pregnancy with rich stores of calcium in her bones, it is much easier for her with a good diet to keep up adequate supplies of calcium both for her own and her child's needs; and her chances of a shorter, easier labor are better.* It has been shown too, that the hemoglobin level of the blood tends to decline during pregnancy and that febrile complications of delivery occur less frequently in those women who have higher hemoglobin levels at this time.^{40, 212} Certainly the woman who begins pregnancy with a normal hemoglobin level stands a better chance of keeping it there. In a more general way, the woman whose habits of eating, sleeping, exercising, eliminating and posture are optimum and so long-practiced as to be almost automatic has fewer changes to make in her habits in a period which requires a great many adjustments at best. She approaches pregnancy with a positive buoyant health which means better general resistance to infection, fatigue and other physical hazards which may beset her path. Because of her good health she also finds a good emotional adjustment easier.

Similarly, the mother's life-long mental, social and emotional development and habits are of great importance to her in her adjustment to the changes involved in pregnancy and the birth and care of her child. In this area too it is not possible to change overnight the habits of a lifetime, and the more practice she has had in

*One group of college women have what they call a "Five Year Plan." They hope that within five years they may marry and begin to have families, and in preparation they conscientiously drink three cups to a quart of milk daily to maintain and enrich calcium stores.

good mental hygiene, the more readily will she maintain her mental outlook at a high level now. Since the interaction between mind and body is so close, this is important for her own physical well-being and consequently for that of her child. It is also essential for the peace and happiness of her husband. Since there is no connection between the nervous systems of the mother and fetus, the old ideas that emotional shocks to the mother might mark the infant were unfounded, of course. There is increasing evidence, however, that through chemical or endocrine influence the emotional life and activity level of the mother during gestation may contribute to the shaping of both the prenatal and postnatal behavior patterns of her child.³³⁵

Preconceptional Preparation of the Father.—The father's influence upon the unborn child once the child is conceived, is only indirect as he contributes to the well-being of the mother. This is not true after the birth of the child, however, when the father as a person and a parent is as important to the child as the mother. From this point on we can say that the entire growth and development of the father, physical, mental, emotional and spiritual, is of utmost importance in the growth and development of the child. The role of the father will be referred to frequently, especially in Chapter XI, but here is a statement credited to Lorine Pruette: "The healthy home permits the creation of the personality of all of its members and its psychological health is based upon three aspects: (1) The emergence of the child as an individual; (2) the mother as a person; and of (3) the father as a parent."* It should never be forgotten in any planning for the coming of children or for the care of children that fathers and fathers-to-be are parents.

Planning to Have Children.—In recent years much has been written and said about "planned parenthood," a term which for sometime tended to be synonymous in the minds of most people with the term "birth control." Lately, however, the term is coming to have a broader and more positive meaning; that is, it is losing the connotation of planning not to have children and taking on that of planning to have children. Birth control undoubtedly has its place in maintaining the health of the womanhood of the world and in the eugenics of society. However, we read with some alarm combinations of figures such as those revealed in the following. While a few decades ago the contraceptive industry was a negligible one, in 1937 it sold \$250,000,000 worth of equipment, showing

*Quoted in Coghill⁷⁹ (p. 685).

itself to be almost equal to the jewelry business in its magnitude* In Indianapolis among native white couples up to 1941, 281 children had been born per 100 wives whose schooling was discontinued below the seventh grade, while 100 wives with high school education had had 113 children and those with four or more years of college had had only eighty-eight.³⁹⁶ Over 10 per cent of the group of wives who owed most to society for the opportunities they had enjoyed and who should have been best able to pass on a good intellectual inheritance to the next generation and best able to provide a rich environment in which children might achieve their fullest potentialities, did not reproduce. The National Health Survey in 1935 showed that among 596,474 urban white women between the ages of fifteen and forty-four years the fertility rate for married women was 139.9 for those in families with incomes less than \$1000 per year; 93.0 for those with income of \$1500 to \$1999; and 84.6 for those with incomes of \$3000 or more. For all women the rate was 82.1 for the first group and only 31.1 for the third.† In other words, a higher percentage of women in the upper income group had not married, and those who had, gave birth to fewer children in 1935 than did those married women in the lowest and middle income groups who were less able financially to provide good prenatal care and an adequate environment for their children after birth.

The use of contraceptive devices is undoubtedly only one of many causes in a complex problem which needs much study and much thought and effort on the part of the public in general and women in particular. As there has been considerable emphasis upon planning not to have children, we need to shift the emphasis to a more positive one, that is, *planning to have children*, spacing them, if you will, for the sake of maternal health, timing their arrival, perhaps, to coincide with a period when father can be at home to care for the older children or otherwise planning a time that will fit in most comfortably with family living, but, in any case, purposefully planning to have children. The majority of the mothers who bring their children to our Merrill-Palmer growth laboratories are women who have had two or more years of

*The accident of birth. *Fortune*, 17:84 Feb. 1938.

†Karpinos, B. D. and Kiser, C. V.: The Differential Fertility and Potential Rates of Growth of Various Income and Educational Classes of Urban Population in the United States. *Milbank Memorial Fund Quarterly*, 17:376 (Oct.) 1939.

college work, and the happiest women of our acquaintance are those among the group who are as purposefully planning and building families as earlier they planned and built professions. These women and their husbands are realistic and know that rearing a family carries with it responsibility as well as joy. They accept the fact that children will inevitably have considerable "nuisance value," as one professor of child development, himself the father of several, puts it. Accepting the responsibility, and the "nuisance value," however, these same men and women are those who tend to have the greatest joy in their children, both in anticipation and in reality.

Adjustment to Pregnancy in the First Year of Married Life.—If the baby is to come within the first year of married life, it means that the woman becomes pregnant very soon after marriage. It means that she will be having to make the many adjustments to marriage at a time when she may be suffering from some of the physical disturbances that sometimes accompany pregnancy. This may put a rather heavy burden on both the man and the woman, with the result that the first year of married life may be fraught with many trials which the young man and young woman were in no way prepared to expect.

There is the sex adjustment to be made; the adjustment to living in close proximity with some one whose little daily habits of living are not known and which may be annoying, the possible adjustment of one or the other to an entirely new circle of friends and relatives or the adjustment of both to an entirely new place. There may be the need on the part of the wife to adjust to household duties after having led a business or professional life as well as the need of adjusting to the fact that she is still of economic value even though she may not be an earning member of society. There may be the need of the young man to adjust to the burdens and responsibilities of a householder and the economic burden which accompanies the setting up of a household. There may be coal bills and plumbing bills and sundry other bills of which he never dreamed confronting him for the first time in that first year of the new life.

Both husband and wife have to give up a certain amount of independence and adjust to the needs, desires and tastes of another person, and unless there is a willingness to face the fact together and a readiness on the part of each to respect the rights of the other and not to assert his own rights to the exclusion of another, the time

of adjustment may be quite difficult. Obviously the first year of married life represents a period in which people are finding out whether or not they can adjust satisfactorily to each other. If pregnancy occurs in this year, added to all these adjustments which must be made, both must realize that there is to be a new member in their family who will absorb a great deal of time and who may require an entirely different mode of living from the one they are following.

A planned pregnancy may delay one adjustment until other basic adjustments have been made. However, many people do not believe in planning pregnancies. Our records also show that many young couples manage very well to make the difficult adjustments of a pregnancy in the first year of marriage.

A willingness to face facts, a knowledge of how to meet some of the situations by applying the important information and training given previously, and an honest love for each other which has in it a spirit of cooperation and a sense of respect for the other's individuality, constitute the equipment for meeting the first year of married life with a high degree of success whatever the necessary adjustments.

Family Adjustments in Preparation for the New Baby.—Whether the baby comes in the first or in a subsequent year of marriage, there are various adjustments which both husband and wife must be prepared to make. While these will differ somewhat both in degree and kind, depending upon whether the new arrival is a first or a later child, the planning and preparation should be of such intense and mutual interest as to draw together the two whose love has produced the pregnancy into a closer sympathy and understanding and to make them look upon this period as one of deep joy. When, however, both husband and wife have in advance some realization of what adjustments are to be made, they are better equipped to meet them successfully and less likely to think of them as difficulties or problems.

Financial Considerations.—Both husband and wife must realize the importance of adequate care for the woman and the expense which it entails. They may be financially able to secure one of the best specialists in obstetrics in their vicinity, or it may be necessary to secure the best available obstetrician at the lowest possible cost. Economy may necessitate going to a special clinic for pregnant women, thereby securing the services of well-trained physicians at little or no cost, and going into a hospital ward rather

than to a private room when the baby is born. The important thing is for the husband and wife to choose wisely a physician whom they know is well trained, preferably a specialist in obstetrics.

The parents must, of course, plan for the baby in accordance with their pocketbook. In talking with their physician they must be quite frank and ascertain what his charges will be, and if his charges are more than they can afford, they should say so frankly. There should be no sense of shame in saying that one cannot afford a certain charge, and one finds that the best physicians prefer this honest acknowledgment on the part of a patient. If the charge which an older man with years of experience makes is too high, such a physician will refer the patient to a younger man who, though well-trained, has not had the experience which would warrant the higher fee of the older man.

It may be that the husband and wife in deciding to go to a specialist for care during pregnancy and the obstetrical period will have to withstand the prejudice of an older generation who considers such precautions and additional expense unnecessary, but they can fortify themselves with the facts and statistics which show that good prenatal and obstetrical care saves the lives of mothers and babies.

Between 1930 and 1934 the maternal death rate in the United States dropped only 12 per cent, but during the next five years after the nation-wide program of health services for mothers and children under the Social Security Act, the maternal death rate fell 32 per cent, while during the corresponding period the death rate for all causes for persons of all ages dropped only 5 per cent.⁸⁵ In the United States in 1941 the maternal mortality rate was 2.89 per 1000 live births; in Uruguay that year it was 2.05; in Chile it was 7.75; and even New Zealand with the lowest infant mortality in the world had a maternal mortality higher than that in the United States, 3.36.⁴¹⁶ The New York Academy of Medicine made a study of puerperal deaths in New York City from 1930 to 1932, finding that 1343 of 2041 deaths, or two out of three, were preventable, two-thirds of them through better care on the part of the attendant, and one-third through better care on the part of the woman herself and better use by her of available facilities.¹⁷²

The leading causes of maternal deaths are infection, toxemia, and hemorrhage, trauma and shock (the last three are usually grouped together). In the last decade reductions have occurred in all three

categories, especially the first two. Abortions account for 17 per cent of all maternal deaths in the United States, and certainly many of these need not occur.⁴¹⁶

In Idaho the maternal mortality rate was as low as 2.2 per 1000 live births in 1939, and there is every reason to believe that rates less than 2.0 are possible with good care.⁸⁵

The United States has succeeded, in addition, through good prenatal care and public health education, in greatly reducing its infant mortality rates. The rate has dropped from 64.6 per 1000 live births from 1929 to 1931 to 45.3 in 1941. Although statistics are compiled somewhat differently and are, therefore, not exactly comparable either for maternal or infant mortality rates, some comparison with rates in other countries is interesting. As has been said, New Zealand's infant mortality rate has for some time been the lowest in the world. In 1941 the rate in this country was 29.8 per 1000 live births. In the same year other countries with very low figures were Sweden (36.7), Australia (39.7) and the Netherlands (41.8). Uruguay with a very low maternal mortality rate had an infant mortality rate of 82.8 in 1941. While her 1941 rate of 63.0 was still very high, Germany had reduced her rate from 186.6 for 1919 to 1921 to this relatively low figure in 1941. Chile's rate was 200.2 in 1941.⁴¹⁶

In countries where infant mortality rates are lowest, the proportion of total infant deaths accounted for by neonatal deaths in the first month is highest, and this fact has suggested the need for more extensive research on the causes of death in the first days of life. It has also given considerable impetus to the growing awareness among obstetricians and professional workers in related fields that adequate obstetric care involves preconceptional as well as prenatal care if the life and health of the infant as well as that of the mother are to be protected.

Changes in Living Conditions.—It may be that the arrival of the new baby will necessitate a change in living because the present quarters seem too small to add a third person whose regimen is to be so different from the regimen of his parents. It is generally advised that a baby sleep in a room by himself if possible. In this way he can live in accordance with his schedule without interfering so much with the normal activities of the family. Their movements and the lights in their room will not disturb his sleep. If things needed for the care of the baby are kept in this room, and if the bathroom is near by, the many necessary things which must

be done for the baby can be done with the least effort, an important consideration for a woman who may have many other household duties besides the care of the baby. If moving is to be done, it should be planned with the advice of the physician at a time and in such a way as to avoid overfatigue for the wife.

Changes in Habits of Living.—Both husband and wife must realize that a baby will make a great difference in their household. They will not be free to come and go as independently as they did before. The night's sleep will probably be interrupted because the baby must be fed for a time once or twice during the night. The late Sunday morning sleep may also be interrupted. These adjustments are a small price to pay for the joy of having a baby, but prove irritating to some young people if they do not appreciate them in advance and accept them as part of a great experience.

Preparation of Parents for These Adjustments.—Parents will make the adjustments described above and any others necessary with much more ease if, before the coming of the first baby, they have had some instruction in what to expect and some experience in child care. A great many classes in infant care are now being conducted by public health clinics for prospective mothers and sometimes for prospective fathers. Some of these are excellent and many are good, but too often they give class instruction without observation of babies or practice with them. Thus these classes frequently engender anxieties in parents by making them aware of all there is to know about infant care and the hazards of not knowing, without giving them the assurance and security in their own competency which comes only through practice. A generation or two ago a large majority of the young people grew up in large families and usually had lots of practice either with their younger brothers and sisters or, if they were younger children, with their nieces and nephews. In many ways they were better off with practice and without instruction than youth today, who may have instruction but frequently do not have practice.

In an age when we offer in our schools and colleges special training for almost every other vocation or profession, we still offer little or nothing in the way of special education for life's most important profession, namely, parenthood. We need to see that both our high schools and colleges do offer such training for men as well as for women. In the meantime, if adequate instruction and experience for prospective parents is not available through some Child Center, a very practical procedure is to select a

pediatrician, or, if the family cannot afford a private physician for the baby, a pediatric clinic, and ask the doctor or the clinic to recommend a few good books which can be studied by both father and mother. Often there are friends who have young children and who will be glad to demonstrate for the prospective parents at least such procedures as bathing and feeding. After the parents-to-be have practiced a little, they may even take over occasionally while the parents enjoy a little freedom. Another place in which practice may be had is in an orphanage or a home for illegitimate children. Such places are usually short of helpers and will gladly give instruction in return for some volunteer help. While such experience may not be as good as that obtained under the constant supervision of a trained instructor, the opportunity to learn to handle and care for babies without fear is an invaluable experience which will not only make the new father and mother feel that the care of their own child is easier, but actually will make it easier, for tension or lack of it in the infant is very apt to be a direct reflection of the degree of insecurity or security of his parents in their own feelings of adequacy in respect to his care. Parents with some previous experience in child care are aware not only theoretically but practically of the "nuisance value" of children and also of the overbalancing pleasure in their society. Consequently, they are prepared to accept the former in their own children without irritation and frustration and, through the waiting period, to anticipate their child with even keener joy.

DIAGNOSIS OF PREGNANCY

The medical preparation for safe pregnancy with optimum health and comfort for the mother and optimum environment for the developing embryo and fetus begins, as we have said, with the beginnings of the lives of both parents. The more immediate medical preparation should begin preferably with thorough premarital examinations of both the man and woman contemplating marriage, and certainly with thorough preconceptional physical examinations of both partners. Every married woman should know the probable signs of pregnancy in order that she may know when she may be pregnant. When she suspects that she is, she should go at once to her physician. She can learn from her physician whether or not she is pregnant and, if she is, can begin intelligent care under his supervision at once.

Probable Signs and Symptoms.—*Cessation of Menstruation.*—If the married woman who has previously menstruated regularly goes more than ten days beyond the expected date without menstruating, she has good reason to suspect that she is pregnant, although this is by no means positive proof that she is. Many other causes than pregnancy can account for cessation of menstruation and, conversely, it is not uncommon for a woman to have one or two periods, usually very short, after conception has occurred.

Changes in the Breast.—Other indications of pregnancy which a woman notices about the second month are an increase in the size and firmness of her breasts and the greater prominence of the veins of the breast. The nipples become darker and more prominent, and the areola (the dark circles around the nipples) increase in size and also darken, particularly in brunettes. There is often a pricking or tingling in the breasts even before they increase in size. Sometimes they become very tender soon after conception and may remain so for some time. Later on in pregnancy some protuberances like miniature nipples appear in the areolae. Change is more pronounced in women pregnant for the first time than in women who have had previous pregnancies.

Increased Frequency of Urination.—Early in pregnancy there may be an increased frequency in the desire to urinate due, not as so many women think, to kidney trouble, but to the stretching of the base of the bladder, by the growing uterus. This causes a sensation like that of a full bladder. Since the need for frequent urination is so often a sign of some nervous tension, it cannot by itself be considered a sign of pregnancy. It is simply additional evidence when other signs of pregnancy are also present.

Other Signs and Symptoms.—Some women, beginning usually about two weeks after the first menstrual period missed, may have waves of nausea without vomiting for a few hours in the morning and some may actually vomit. This is commonly called "morning sickness." However, this sign, unless accompanied by other symptoms, is of no diagnostic value as it may also be a symptom of many other conditions. Extreme fatigue is sometimes another symptom of early pregnancy.

The woman herself may be aware of the *enlargement of her abdomen* by the end of the third month, when she may be able to feel a softness just above the pubic bone. By the end of the fifth month, when the uterus will have enlarged and pushed up in the abdomen to the level of the navel the enlargement will be quite

obvious. By this time, too, the pregnant mother will usually have felt tremulous movements of the fetus low in the abdomen.

Any woman for whom pregnancy is a possibility should, after experiencing any of the above signs, see her physician in order that he may make a definite diagnosis as promptly as possible. If several of these signs are present, the physician will be helped in making his diagnosis. However, since no one of them is definitely diagnostic of pregnancy, he will also want to examine the patient for other more positive signs.

Pelvic Examination.—After he has made a professional examination of the breasts to corroborate the changes which the patient has probably observed herself, the physician will also do a simple, painless pelvic examination. First he will inspect the mucous membrane of the vagina, which, ordinarily pink in color like mucous membranes elsewhere in the body, early in the first pregnancy takes on a bluish cast.* He will also palpate the uterus to determine its size, shape and consistency.

Positive Signs.—*Fetal Heart Sounds.*—Detection of the fetal heart beat is an absolute sign of pregnancy. This is frequently possible by the middle of the fifth month, the sound being detected by the doctor with his stethoscope, or sometimes by placing the ear against the abdomen. Through fetal electrocardiography this is often possible even earlier in pregnancy.^{131, 39} In fact, Bernstein and Mann³⁹ after studying 100 cases report positive results in 61 per cent of the cases attempted in the fourth lunar month.

Fetal Movements.—While the mother may sometimes mistake movement of gas in the intestines for fetal movement, the physician examining the abdomen will not be mistaken if fetal movements are felt, since his experienced hand can detect the difference. Such movements also constitute a positive sign of pregnancy and may be felt by the end of the fifth month. However, by this time the physician is usually so sure of his diagnosis as not to need such confirmation.

X-ray Diagnosis.—Occasionally x-ray is used in diagnosing pregnancy. Again, however, since the skeleton of the fetus rarely shows up before the middle of the fourth month, this test is usually not necessary and is not often used.

Legally, any one of these three is acceptable as a positive sign of pregnancy, that is, the detection of fetal movements, or of fetal

* After the first pregnancy this change in color may persist, to a degree at least, so that this sign is less significant in a subsequent pregnancy.

heart sounds by the trained examiner or the detection of the fetal skeleton by x-ray.

Laboratory Tests.—If very early diagnosis is imperative for medical reasons, certain laboratory tests may be used. Those of established accuracy are expensive and time consuming and unnecessary in most cases. More recently attempts have been made to devise simpler, less expensive tests which might be routinely used. Thus far different experimenters have reported quite varied results as to the accuracy of these tests.

PHYSICAL CHANGES IN THE MOTHER DURING PREGNANCY

Although there may be various discomforts during pregnancy and occasionally serious complications, for the healthy woman this is more often a period of increased well-being and of even more vigorous health than usual.

Increase in Weight.—An average normal woman increases in total weight during pregnancy from 20 to 30 pounds, which represent the weight of the fetus, the placenta, the membranes and the fluids and some gain in her own weight because of improved appetite and digestion. There is some tendency for larger women to gain more. In about two-thirds of normal pregnancies, weight increases will vary between 13 and 35 pounds with an average of 24.0 pounds.⁷⁴ During the early months of pregnancy weight gains are ordinarily only two to three pounds, while during the last three months the gains range from 3.5 to 5.5 pounds per month. The weight is carefully watched by the obstetrician and not allowed to become excessive, since excessive gains may mean retention of fluid in the tissues, a warning of possible danger.

Randall²⁸⁶ at the Mayo Clinic has made a very interesting study of weight in pregnancy and has emphasized the importance of watching weight during that period. He studied 200 normal women, pregnant for the first time, who made an average total gain of 23.2 pounds, 7.75 pounds being added in the last eight weeks. He also studied 100 women who were pregnant, but not for the first time. Their average gain was 21 pounds, 5 pounds being added in the last eight weeks. He compared these gains with those of pregnant women who were toxic. The average total weight gain of toxemic patients was 44.5 pounds as compared to a gain of 23 pounds for normal patients in first pregnancies and 21 pounds for normal patients in other pregnancies. This total

weight gained is not as significant as the fact that 25.4 pounds was gained by toxemic subjects during the last eight weeks of pregnancy, compared with 7.75 pounds for the first pregnancy and 5 pounds for later pregnancies.

The Uterus.—This organ, situated within the pelvis, must stretch from a small, almost solid organ, shaped something like a pear and approximately three inches long and weighing about two ounces, into a large muscular sac, weighing about two pounds, which will hold a seven or eight pound or even larger baby, a placenta weighing about one and one-quarter pounds, about twenty inches of umbilical cord and a quart or more of amniotic fluid by which the baby is completely surrounded. The capacity of the uterus has to increase about 500 fold in order to do this, and its total weight with contents becomes about fifteen pounds. Through hypertrophy of its muscle walls, this sac must have, when the time comes, power to contract with such force that the baby and placenta will be expelled from the uterus through the vagina into the world. The greater part of the growth of the uterus occurs during the first three months of pregnancy. Its increase in weight is due partly to the growth of new muscular tissue and partly to an increase in the size of the muscle already present. A woman, to accommodate herself to the change in size, weight and position of the uterus and its contents, sometimes noticeably changes the way she carries herself, tending to throw her head and shoulders back.

Because the uterus is attached to ligaments which are fastened to the pelvis and is not fixed in a stationary position, it is enabled as it grows to push upward into the abdominal cavity. It does this at about the fourth month, and continues to rise, the top of it reaching the umbilicus by the sixth month and the diaphragm by the ninth month. During the last two or three weeks of gestation the uterus drops back toward the pelvis again, and the change in the contour of the body indicates to a woman that she is drawing near the end of her pregnancy.

The Mammary Glands.—The breasts, or mammary glands, are skin glands which have undergone highly specialized overdevelopment. The early cell mass undergoes a process of multiplication and ramification into a fairly complex duct system. Later, actual secreting glandular cells develop. One of the first signs of oncoming puberty in the female is increased activity in the breasts when these glandular tissue cells increase in size and number and

increasing deposits of fat occur in and around this glandular and duct tissue. When pregnancy occurs, further mammary glandular development takes place. Estrogens cause growth of the duct system, and the addition of progesterin carries the development into the glandular tissue proper, the alveolar cells. To what extent these ovarian hormones affect the breasts directly and to what extent through the pituitary gland is not clear. After the placenta is formed, hormones from it add further stimulus to breast development.¹⁷⁴ By the middle of pregnancy, colostrum, a clear watery liquid streaked with yellow, is secreted. Lactation does not occur, however, until after delivery. That there is interaction of numerous endocrine substances in the process of mammary development and of lactation is known. The exact nature of this interaction is less well known. Moreover, there is little concrete evidence as to the mechanism responsible for the release of lactogenic (stimulating the production of milk) hormones following parturition, although there is much speculation.²⁷⁵

Other Changes.—The basal metabolic rate of the pregnant woman is increased as the thyroid gland becomes more active. This accounts in part for the increased feeling of well-being and energy which is frequently a part of normal pregnancy. Various other endocrine glands, as the cortices of the adrenals and the anterior lobe of the pituitary, become more active also.

Various organs in the body seem to be more active during pregnancy and possibly less stable. Skin glands, the skin being an important excretory organ, increase their activity, and perspiration may increase. Especially during the later part of pregnancy there is a normal increase in the vaginal secretion. Because of its antiseptic qualities this is looked upon as an additional safeguard during delivery. There may also be a more luxuriant growth of hair, and often hair which has been lifeless before pregnancy takes on a much healthier appearance.

DEVELOPMENT OF EMBRYO AND FETUS

Maturation of Germ Cells.—Each cell of the body has in its nucleus forty-eight chromosomes on which are carried the genes or determiners of heritable traits. This is as true of immature germ cells as it is of other cells of the body, but mature germ cells have only twenty-four chromosomes. If two germ cells, each with forty-eight chromosomes united, the new individual thus formed would have ninety-six chromosomes in each of his cells, and a new

species would be initiated. Nature has provided for the maintenance of the species man by a process of division of germ cells which results in a mature germ cell containing only twenty-four chromosomes. In this way the paternal germ cell and the maternal germ cell each contributes twenty-four chromosomes to the new being whose life begins when the ovum, or female germ cell, is fertilized by the spermatozoan, or male germ cell.

While the ovum is still in the ovary, it divides into two cells each with twenty-four chromosomes. The forty-eight chromosomes in the immature cell are arranged in pairs, and each of the new cells contains one from each pair. One of these new cells contains most of the cell cytoplasm and is much larger than the other cell. Each of these cells again divides, this time with the usual type of cell division in which the chromosomes divide longitudinally. Again there is one larger cell and one very small cell resulting from the division of the cell which carries most of the cytoplasm of the original immature cell. Thus there results from these two divisions one larger cell, the mature ovum and three small cells called polar bodies which soon die. Actually the larger cell is extremely small, for it has a diameter of about $1/125$ inch.

Division of the immature sperm cell is similar to that of the immature ovum except that in the case of the sperm cell there are four mature spermatozoa formed. Each of these cells measures only about $1/450$ inch in length.

Determination of Sex.—In each set of the original forty-eight chromosomes on each of these immature germ cells there is one pair which is responsible for determining sex. In the female the two chromosomes of this twenty-fourth pair are alike and are usually designated as the "XX" chromosomes. Thus the twenty-fourth chromosome in the mature ovum is always one of these X-chromosomes. In the male, however, the members of the twenty-fourth pair are unlike and are designated "XY." In the process of division of the sperm cells, spermatozoa will result with the Y-chromosome as well as the X-chromosome. The sex of the new individual, conceived when a mature spermatozoan penetrates and thus fertilizes an ovum, will depend upon whether this spermatozoan carries a Y or an X chromosome. If it carries a Y, the twenty-fourth pair in the new being will be XY, and a male baby will result; if it carries an X, the resulting twenty-fourth pair will be XX, and the new child will be female (Fig. 3).

Fertilization.—About every twenty-eight days during the child-

bearing period of a woman's life, an ovum matures, probably alternately in first one and then the other ovary. It is swept into the fallopian tube and passes along this tube on its way to the uterus. If sexual intercourse occurs about the time the ovum is

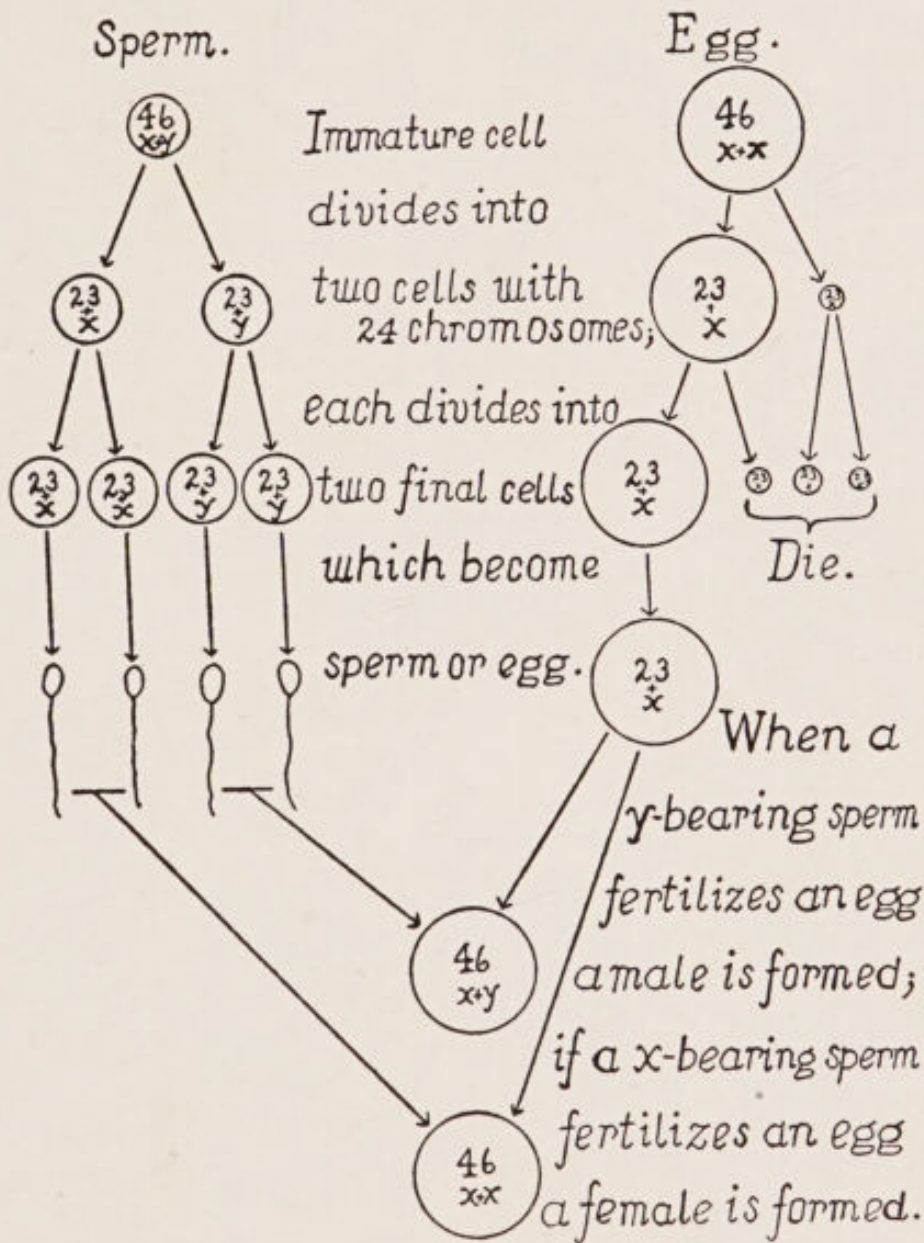


Fig. 3.—Maturation of the sperm (on the left) and the egg (on the right), and their fusion to form a male or female individual. The forty-eight chromosomes of each immature cell are indicated as 46 plus x-y in the male, or 46 plus x-x in the female. (Gilbert, Margaret Shea: Biography of the Unborn. Baltimore, The Williams & Wilkins Company.)

expelled from the ovary, spermatozoa travel up through the vagina, uterus and tube to meet the descending ovum. When a spermatozoan penetrates the ovum, fertilization occurs. While usually only one ovum a month is matured, nature lavishly multiplies the pos-

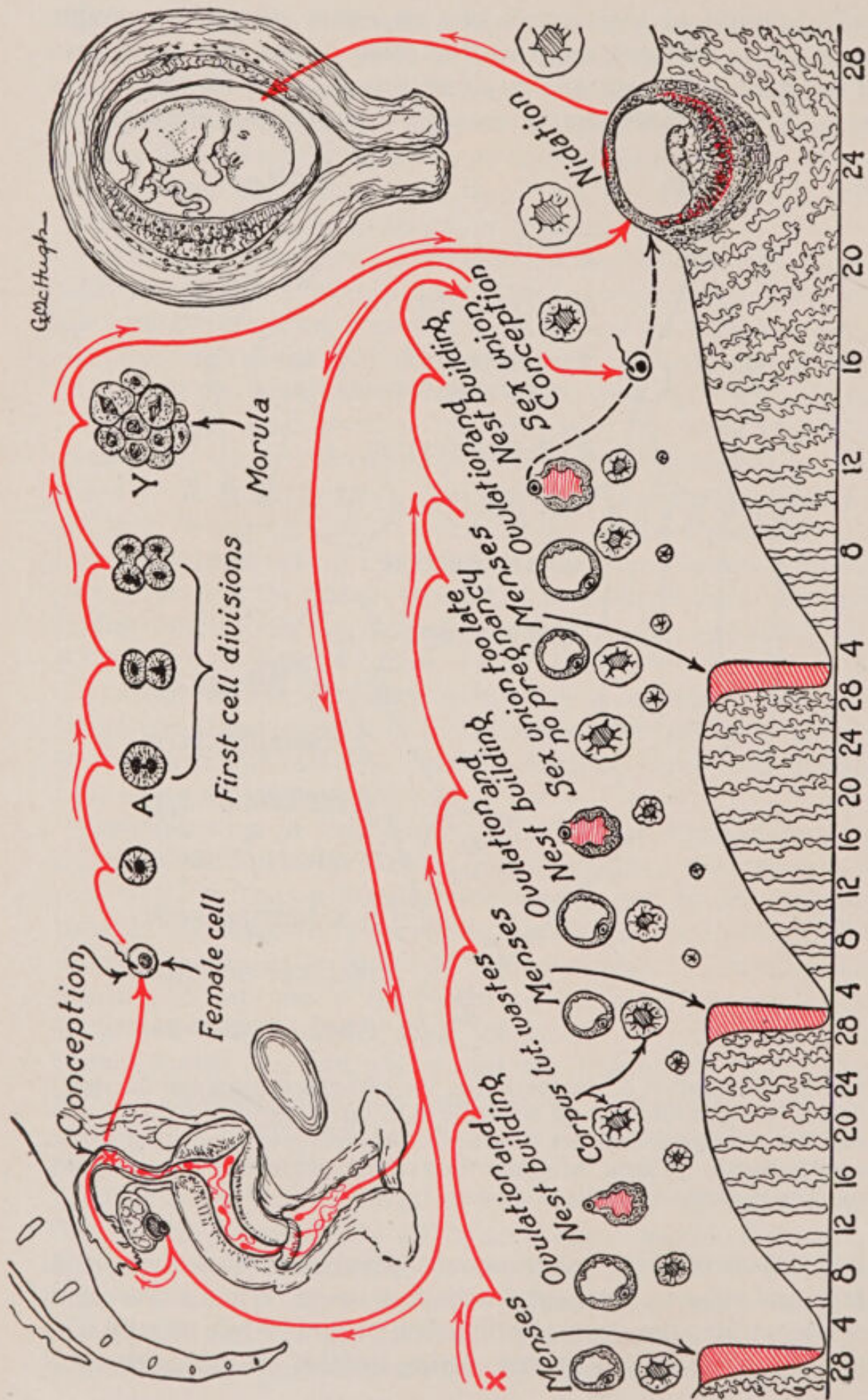


Fig. 4.—Chronology of reproduction. Follow red arrows: begin at x. Below are days of menstrual cycle and changes in uterine mucosa. Note growth of its glands. Follow course of corpus luteum. (Davis and Carmon: DeLee's Obstetrics for Nurses.)

sibilities of its fertilization by producing about 200,000,000 spermatozoa in each ejaculation. These have long thin tails which give them the power of relatively swift locomotion, and dozens of them may meet the ovum descending the tube. Only one penetrates, however, for after one has fused with the ovum the fertilized cell repels any others.

Figure 4 illustrates diagrammatically what happens in the chronology of reproduction when fertilization does not occur and what takes place when it does.

Implantation.—Immediately after fertilization as the ovum descends the fallopian tube, the nuclei of spermatozoan and ovum fuse, and rapid cell division occurs, resulting in a clump of cells

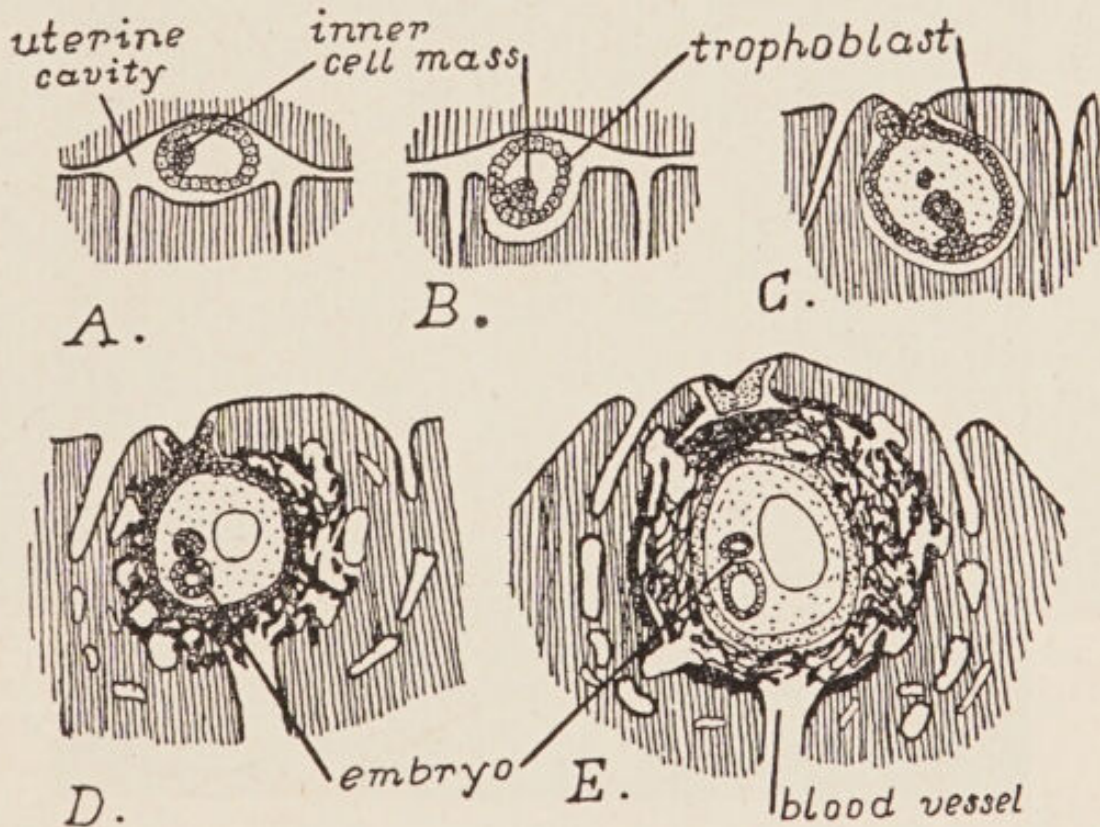


Fig. 5.—Diagrams to show the implantation of the egg in the wall of the uterus. The uterus is marked with parallel lines. A-B-C are hypothetical stages; D-E are the youngest human embryos known.

A. Egg lies in cavity of uterus.

B. Egg lies in small pit in uterine wall.

C. Egg enclosed in small cavity within uterine wall.

D. Trophoblast of egg destroys uterine tissue. The embryo now consists of two small vesicles.

E. Spongy trophoblast processes invade the uterine tissue farther and open blood vessels of the uterus. (After Arey, from Wollard in Gilbert, Margaret Shea: *Biography of the Unborn*. Baltimore, The Williams & Wilkins Company.)

called the morula. It is probably eight to eleven days after fertilization before the ovum implants itself in the uterine lining. The ovum actually burrows through the uterine lining and embeds itself in the thick decidua, richly prepared for its reception (Fig. 5).

Period of the Embryo.—In the meantime, the morula has become a blastocyte or hollow vesicle with an outer layer of cells, the trophoblast or feeding layer, and an inner cell mass which now undergoes rapid cell division and differentiation. This period of

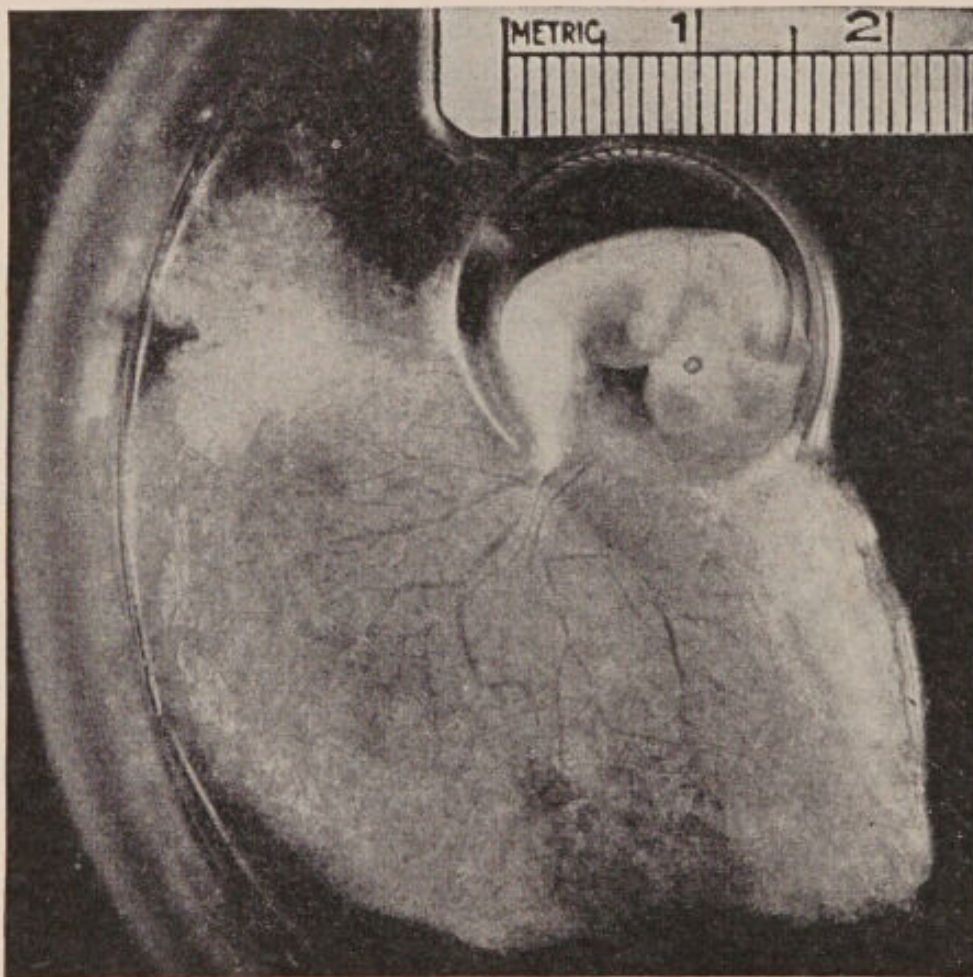


Fig. 6.—An embryo of about 4 weeks showing the blood supply from the chorion (placenta). (Davis and Carmon: *DeLee's Obstetrics for Nurses*.)

differentiation of cells during which the various body organs and tissues are formed extends from about the end of the second week after fertilization until the end of the second month and is called the period of the embryo.

In the very early stages of this period the blastocyte becomes covered with branching projections called villi, and the whole structure is called the chorionic vesicle. The developing embryo is connected with the wall of this vesicle by means of the body

stalk. As cells covering the villi destroy surrounding tissue, walls of the blood vessels in the decidua immediately surrounding the chorionic vesicle are broken down, and the vesicle is bathed by maternal blood which gradually assumes a definite course of flow. Late in the second month of pregnancy some of the villi degenerate, leaving only about one-fifth of the chorion covered. Those remaining, together with tissue developed from the decidua, develop into the placenta, or "after birth." The body stalk becomes greatly elongated and through the resulting umbilical cord run three blood vessels. Two arteries carry blood from the

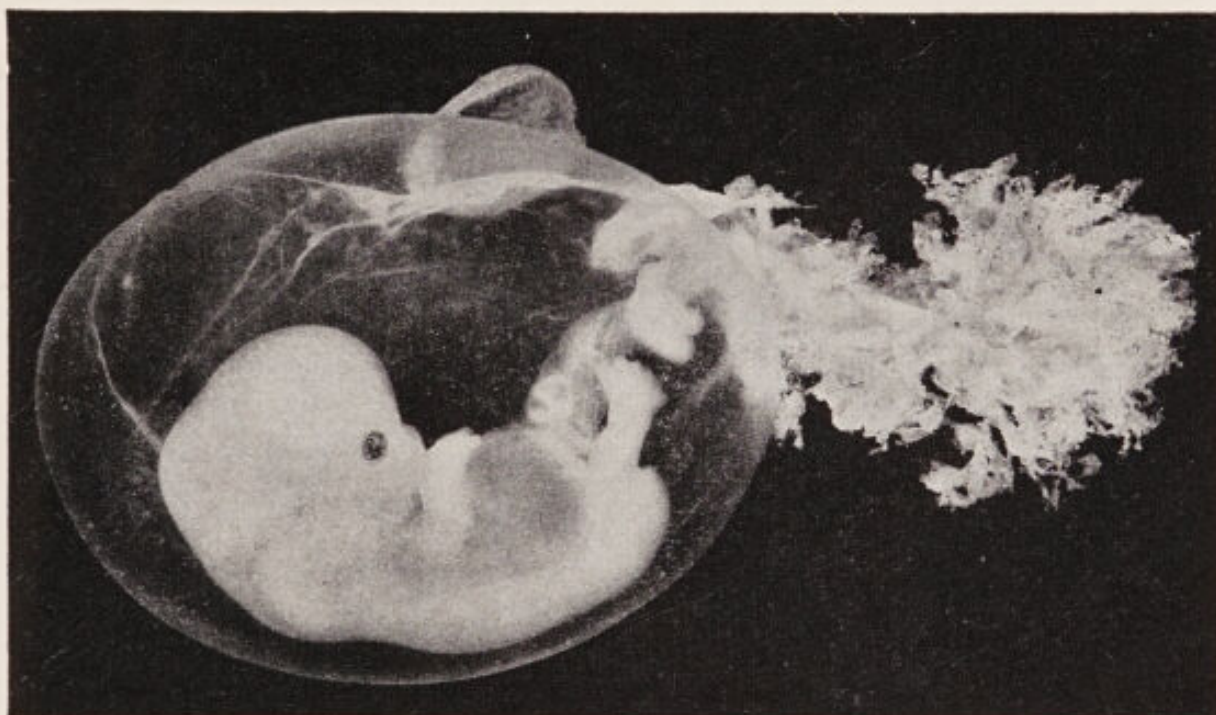


Fig. 7.—Embryo within the amniotic sac at the end of the eighth week. A small fragment of placenta is attached. (Davis and Carmon: *DeLee's Obstetrics for Nurses*.)

infant to the placenta, and one vein carries blood to the infant from the placenta.

The amniotic sac, appearing early in gestation as a transparent, non-vascular membrane, completely envelops the embryo, except at the point where the umbilical cord projects through it to the placenta. The amniotic fluid within this sac acts as a buffer to protect the developing embryo and fetus from jars and shocks experienced by the mother. It also helps provide an even temperature for the developing organism and serves to prevent adhesions between the skin of the fetus and the amniotic membrane (Figs. 6, 7 and 10). By the end of the period of the embryo, two months

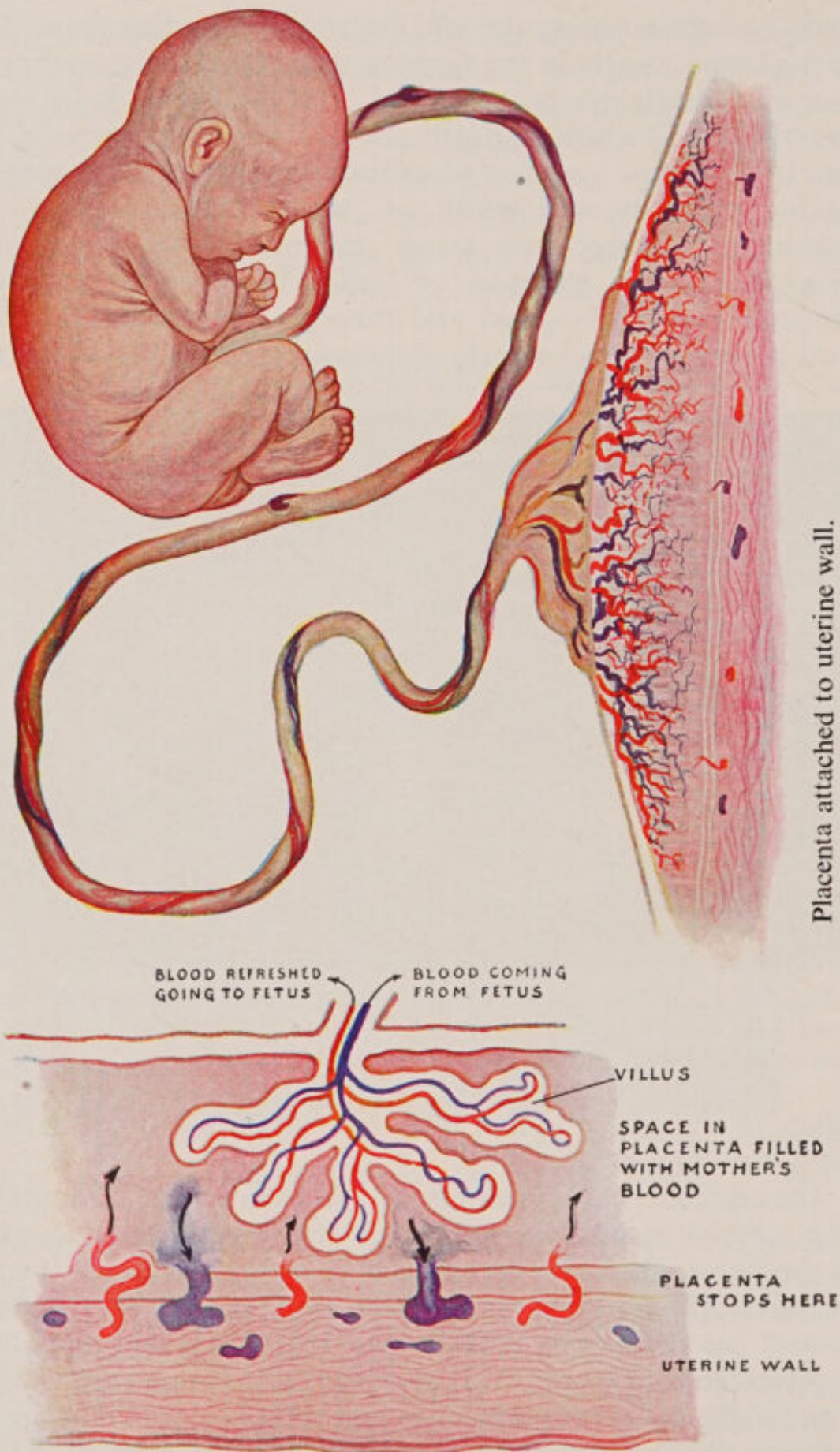


Fig. 8.—The relations of the maternal and fetal circulations. Purely diagrammatic. (Davis and Carmon: DeLee's Obstetrics for Nurses.)

TABLE I.—RELATIONS OF AGE, SIZE AND WEIGHT IN THE HUMAN EMBRYO AND FETUS

Age of Embryo	Crown-rump Length (mm.)	Crown-heel Length (mm.)	Diameter of Chorionic Sac (mm.)	Weight in Grams	Ratio of Increase for Week or Month	
					CR Length	Weight
Two weeks	0.2*	0.2*	2			
Three weeks	1.5*	1.5*	10		6.5	
Four weeks	5.0	5.0	20	.02	2.3	40,000.00
Five weeks	8.0	8.0	25		0.6	
Six weeks	12.0	12.0	30		0.5	
Seven weeks	17.0	19.0	40		0.4	
Second lunar month	23.0	30.0	50	1	0.3	49.00
Third lunar month	56.0	73.0		14	1.4	13.00
Fourth lunar month	112.0	157.0		105	1.0	6.50
Fifth lunar month	160.0	239.0		310	0.43	1.95
Sixth lunar month	203.0	296.0		640	0.26	1.07
Seventh lunar month	242.0	355.0		1080	0.14	0.69
Eighth lunar month	277.0	409.0		1670	0.14	0.55
Ninth lunar month	313.0	458.0		2400	0.13	0.43
Full term (266 days)	350.0	500.0		3300	0.12	0.38

* Total length of embryonic disc.
From Arey, L. B.: Developmental Anatomy.

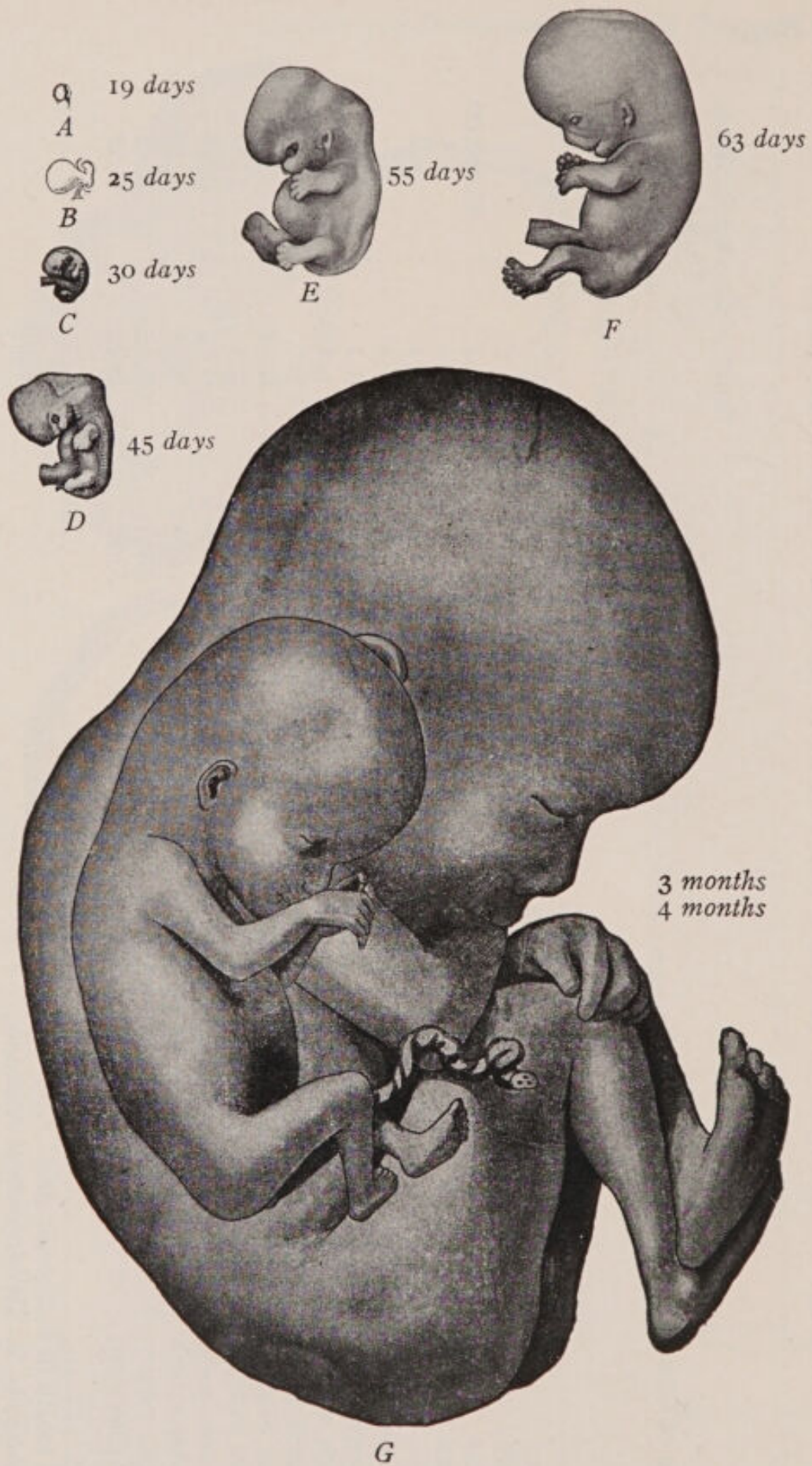


Fig. 9.—A graded series of human embryos, at natural size. (Arey: Developmental Anatomy.)

after fertilization, cells of the three germinal layers, the endoderm, the ectoderm and the mesoderm, have undergone rapid division and differentiation, and a miracle has occurred the like of which the mind of man, with all of its inventive genius, has never been able to achieve. By this time there is a miniature baby, with heart, lungs, brain, spinal cord, head, face, organs of sense, arms, legs, hands and feet with stubby fingers and toes and other essential parts.

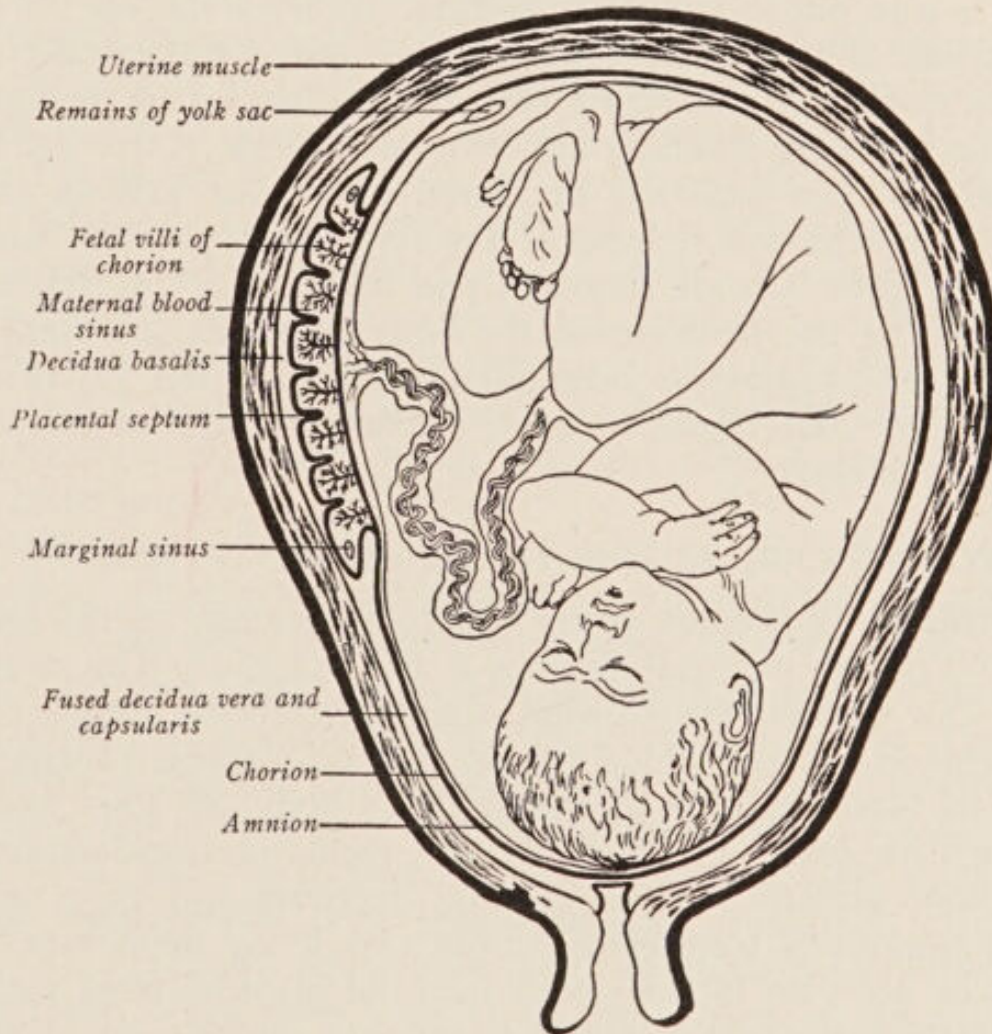


Fig. 10.—Diagrammatic section of the uterus illustrating the relation of an advanced fetus to the placenta and other membranes. (Ahlfeld.)

Period of the Fetus.—A few parts of the body, such as the differentiated external sex organs and finger and toe nails, develop after this time, but, for the most part, growth during the rest of pregnancy consists of growth in size and increase in function rather than differentiation of parts. This later phase of prenatal development, from the end of the second month until the birth of the baby, is usually called the *fetal period*.

“During the *third month* (lunar) the fetus definitely resembles a human being, but the head is still disproportionately large; the umbilical herniation is reduced by the return of the intestine into the abdomen; the eyelids fuse, nails begin forming, and sex can now be distinguished readily. At *four months* fetal movements begin to be felt by the mother; the face has a truly human appearance. At *five months* hair is present on the head and body. During the *sixth month* the eyebrows and lashes grow; the body is lean but in better proportion. At *seven months* the fetus looks like a dried-up, old person with red, wrinkled skin; the eyelids reopen. In the *eighth month* subcutaneous fat is depositing; the testes are invading the scrotum; infants of this age born prematurely can generally be reared (incubator babies). In the *ninth month* the dull redness of the skin fades, wrinkles smooth out, the limbs become rounded, and nails project at the finger tips. During the *tenth month* the body continues to round out, due to the progressive accumulation of fat; the provisional, downy hair-coat begins to shed; the fetus is now ‘at full term,’ ready for birth.”*

PHYSICAL CARE OF THE MOTHER DURING PREGNANCY

Nutrition.—Foremost in the important elements of the general hygiene of the pregnant mother is her nutrition. The mother’s body can nourish the growing organism only by means of the nutrients in her own blood stream. The developing embryo must have its food prepared by the mother’s body; all food must go through her whole metabolic system, including transference into her blood stream. All the growing organism can do is absorb these substances transferred across two living membranes (the walls of her own blood vessels into the placenta, from placenta across the walls of the child’s circulatory system into his blood stream). The ability of the child to absorb these nutrients depends on the cell structure within his own body. The richness of the store that the mother has to give and the child’s absorbing power are important factors in his possibilities for adequate growth and development. In case calcium stores are low in the mother’s body, the mother must share with him the nutrients that constitute her bone and tissue in order that his body may continue to grow. It is obviously important during the prenatal period to

*Arey¹⁶ (pp. 105–106).

have an optimum supply of cell nutrients furnished through the mother's own food supply to avoid depleting her own body. The fetus, for example, must have calcium, phosphorus and iron, which are known to be held within the mother's body for considerable periods, whereas certain other nutrients, such as the B vitamins, are known to be utilized or excreted rapidly. For these reasons adaptation of the mother's diet to maternal-fetal needs is of paramount importance and must be flexible enough to change with the increasing demands of the fetus.

A woman knows at the time of conception what she can digest, what she prefers and what she has to add or eliminate from her diet in order to keep her body in optimum condition, which means her weight is correct for her build and her health is optimum. When she becomes pregnant, she must alter her ordinary, dietary choice so as to meet the needs of the growing fetus and still continue to hold her own body in an optimum condition. The fetus has needs and differences similar to, but not identical with those of the mother. The mother can, therefore, blue-print with some accuracy the needs of the fetus and meet them with some sense of security.

As has been said before, all of life up to the time of pregnancy is in a certain sense a preparation for pregnancy. A wholesome health regimen, an adequate diet wisely chosen and efficiently used by the body and a balanced development of physical, mental, social, emotional and spiritual life are important factors in insuring optimum physical and mental health for the mother. When she knows she is pregnant, a mother does not try to get a nutritional "trousseau" by drinking large quantities of milk, by taking calcium preparations, and eating unusual quantities of leafy foods, but gradually adds those nutritive substances demanded by the fetus to her dietary outfit. If the mother, at the time of conception, is eating food that gives an optimum calcium supply for her own body, she need only be concerned about the quantity the fetus requires. Food for the fetus comes from the arterial blood supply of the mother, which is food in its most highly purified and simplified form. The fetus absorbs what he needs; if he needs calcium, he takes it; if he needs iron, he takes it, so that the mother's first concern should be to meet the needs of her own body so that her stores will not be used to supply the needs of the fetus. Increase in her weight is one indication of the growth of the fetus and of the temporary changes in the cells of

her body (such as enlargement of uterus), but it is only a partial index of the nutritive needs of the fetus.

To keep her body in optimum health and to provide the substances essential for the growth and development of the fetus, the mother must depend upon the food she eats. One of these essential substances is protein. Protein is a part of every living tissue and every fluid of the body contains it. There are many kinds of protein in the food we eat. Some are more valuable to the body than others, some will maintain the body and promote growth, some will only maintain the body, some will neither maintain the body nor promote growth when they are the sole source of the protein intake. In typical protein foods, such as eggs, milk, meat, the protein occurs in large complex molecules which the body can not use to build tissue until they have been split into its simpler components, called amino acids. Laboratories in food chemistry and nutritional research have analyzed the foods we eat for their protein components, studied the changes taking place in their digestion and by means of animal experiments have determined which components will support life and promote growth. In the research investigations with rats and dogs it was found that there are ten amino acids which must be included in the food eaten if these animals are to grow and develop normally. The ten amino acids called "indispensable" or "nutritionally essential" in the sense that they must be furnished through the nutrients are: arginine, histidine, isoleucine, leucine, lysine, methionine, phenylalanine, threonine, tryptophane and valine.³²²

The next question to be solved by the scientists was whether the ten amino acids essential for rats were indispensable to human beings. The solution of this problem had to await the time when each of the amino acids had been purified so that they could be tested individually and fed to human beings. Rose,³⁰³ Holt,¹⁷¹ Albanese⁴ and others have investigated this problem using individual amino acids in feeding human beings and to determine the effect on the nitrogen balance* of omitting them from the diet. Their investigations have shown that eight of the ten amino acids found essential for rats and dogs are necessary to maintain

* Protein differs from other types of food by containing the element nitrogen in its composition. If the body receives and utilizes as much protein as it loses through the urine and feces it is said to be in nitrogen balance. If there is more nitrogen lost than received by the body, the body is said to be in negative nitrogen balance.

nitrogen balance in man. The amino acids about which there is now a difference of opinion are histidine and arginine. Holt¹⁷¹ has found in his experiments with human subjects that a deficiency of arginine does not produce a negative nitrogen balance but does cause profound physiological disturbances. He regards arginine as an essential amino acid.

For a long time the relation between the nutritionally essential amino acids and the hormones and enzymes of the body was not understood. Recent research indicates that insulin (the enzyme secreted by the pancreas and which is essential in the metabolism of sugar) is dependent for its formation on cystine which, in turn, depends on its precursor, methionine. Likewise thyroxine and adrenin are believed to require the presence of phenylalanine before they can be formed.

Schoenheimer,³¹⁴ within the last three years, has given valuable confirmation of the indispensable character of certain amino acids in animal experiments, in which heavy nitrogen* was used to label certain amino acids taken in the food. He found that the amino acid, lysine, when treated with heavy nitrogen and given to an animal, could be traced in his tissues and that it had yielded its nitrogen for the formation of other amino acids but it had never been regenerated. This further confirms the findings of earlier workers and establishes the fact that some amino acids cannot be synthesized by the body and must be provided in the food. Schoenheimer's experiments with animals using isotopic elements as markers have contributed further to our knowledge of the rapid and continuous changes taking place in the cell when protein food is taken into the body. In his experiments with rats on feeding labeled leucine to animals who were in nitrogen equilibrium, he could find out how much of the leucine was lost in the urine and the feces and in what organs it had become a part of the cell protein. It had appeared in the blood, the spleen, the liver, intestinal walls, the testes and in the nervous and muscular systems. Schoenheimer's work gives a clearer picture of the way in which the food taken into the body becomes a part of the cells and how rapidly these changes are brought about, also that for some essential amino acids there is no way the body can obtain them except through the food eaten.

* Substances such as heavy hydrogen and heavy nitrogen (N^{15}) are used to label or mark or identify compounds. Such labeled substances are known as isotopes.

The metabolism studies of Macy and her associates²⁴¹ and of Coons and Blunt⁸¹ indicate an increased requirement for protein during pregnancy and lactation. Observations of women's protein intake when they are not pregnant and when they are pregnant gives some idea of the amount of protein consumed daily under such conditions. If a woman weighs 70 kilograms, or 155 pounds, when nonpregnant her protein intake would be about 1 gm. per kilogram or 70 gm. of protein per day. When pregnant that intake may rise to 90 gm. per day, since her own body weight is increasing, the fetus is growing and the uterus and breasts are enlarging. The daily intake will, of course, depend on the weight of the woman when she became pregnant, the rate of her gain during pregnancy. This is an aspect of her health which her obstetrician will watch and offer advice. Deficiency of protein in the diet of pregnant women has been reported⁴⁰⁷ to lead to nutritional edema,* a tendency to anemia, poor muscle tone, lowered resistance to disease and poor milk supply.

Fats and carbohydrates, which supply energy are usually supplied in sufficient quantities in the average food intake. Their importance aside from furnishing calories, is in their absorption of vitamins by the fat and the protein sparing action of carbohydrate. The economic level of the family often influences the ratio of carbohydrate and fat to protein and other protective foods in the diet of the pregnant woman. Ebbs says that "obesity and excessive gain of weight during pregnancy can be controlled to a certain degree by the regulation of intake of fat and carbohydrate."†

The pregnant woman usually has found the carbohydrate and fat intake suited to her body needs before she becomes pregnant. In general, if she maintains this level and adds gradually to it as pregnancy proceeds and includes fruits and vegetables, which supply minerals and vitamins, she will find no difficulty in meeting her requirement. Most women have to guard against an excessive use of rich pastries and desserts, cakes, ice cream and candy during pregnancy.

Calcium, Phosphorus and Vitamin D.—Calcium is one of the most essential elements of the diet during pregnancy, not only

*The presence of abnormally large amounts of fluid in the intercellular tissue spaces of the body caused by dietary deficiency is a condition referred to as nutritional edema.

†Ebbs¹⁰⁴ p. (387).

from the viewpoint of the mother but also from that of the growing fetus. As early as the fourth month of pregnancy, most of the bones of the fetus are beginning to ossify, and the temporary teeth are forming. The fetus has no source of calcium and phosphorus to draw upon except that in his mother's blood stream, so that her calcium requirement, estimated²³⁹ at 1.5 to 2 gm. per day, is vital to the protection of both of them. That the fetus makes heavy demands on the calcium supply of the mother is shown by the decrease in the serum calcium in the last months of pregnancy. It is in this period that 65 per cent of the total body content of calcium at birth is laid down and 64 per cent of the total phosphorus content.¹⁰⁴

Research seems to have demonstrated that vitamin D is related to the utilization and retention of calcium and phosphorus in the body. The supply of calcium and phosphorus must be adequate or vitamin D can not insure retention. In rats, vitamin D causes an increased retention of calcium and phosphorus in the offspring when the diet is adequate.³⁵⁷ The amount of calcium and vitamin D in the mother's diet affects the density of the infant's bones and the structure of his teeth.¹⁰⁴ The amount of vitamin D required is not definitely known. The Food and Nutrition Board of the National Research Council recommends 400 to 800 units.

If the diet of the pregnant woman is to be optimum in calcium-containing foods, milk, egg yolk, whole grains and green vegetables must have an important part. Of these foods, milk is probably the most economical as a source of calcium.

Phosphorus occurs in most of the protein-rich and calcium-rich foods, so that if the daily food intake is adequate in these two elements, it will, in all probability, contain sufficient phosphorus. Neither calcium nor phosphorus is widely distributed in natural foods so that the mother has to give special attention to be sure that foods containing adequate quantities of these elements are included daily in her diet.

Iron.—The relation of the diet of the pregnant mother to the iron supplies of her body has recently come to be better understood because of exhaustive animal experimentation. The demands of the fetus for iron are insistent since he is growing rapidly and there is need for iron to supply the hemoglobin in the expanding blood volume and in the building up of muscle. In addition, the fetus has to accumulate a reserve store of iron which will be used after he is born. The proportion of iron to fetal weight

is fairly constant. During the first six months the mother transfers about 0.4 mg. of iron to the fetus daily, but in the last three months, when the weight of the fetus increases rapidly, the transfer is about 4.7 mg. daily or ten times that of early pregnancy.⁴⁰¹ The iron content of the infant shows a reserve of about 186 mg. which he needs to carry him through the first months before he can eat foods that are good sources of iron.⁴⁰¹ One of the concerns of pregnant women is the development of the so-called physiologic anemia of pregnancy. Certain studies by Burke and her associates show a definite relationship between the amount of iron in the mother's diet during pregnancy and her hemoglobin value during and following pregnancy as well as that of her baby at birth.^{61a} Strauss pointed out that anemia was present in the first year of life in babies born of anemic mothers although the hemoglobin was normal at birth.³⁴⁵

The minimum daily requirement during pregnancy seems to be 15 mg. of iron. In general terms the mother needs to increase her intake of iron about one-fourth. Fruits, green vegetables, egg yolk, red meat, whole grains and glandular organs, such as liver, kidney and sweet-breads are high in their iron content.

Iodine.—The thyroid gland may become overactive in many women during pregnancy, and an increased amount of iodine is needed to provide for the secretion of this gland. Under ordinary circumstances the diet would supply sufficient quantity, since there is some reserve in the gland itself, but if the diet has been low in iodine, as may occur in the region of the Great Lakes and the Northwest, where the amount of iodine in soil, water and foodstuffs is very low, it may have to be supplemented. This should be done under medical direction. In other regions besides the "goitrous regions," a diet with an abundance of green vegetables, whole cereals and some sea foods will meet the average demand for iodine. Iodized salt is a desirable way of adding iodine to a diet that may be low in this element.

Vitamins.—The role of vitamin A in reproduction is uncertain, but it is known that vitamin A is required for growth and for normal functioning of tissue. The importance of vitamin A in the development of the fetus in pregnancy is suggested by the studies of Wolbach and Howe.⁴¹¹ They showed changes in the structure of developing teeth in vitamin A deficient rats and guinea pigs. The newborn has very low stores of vitamin A but he can receive an adequate amount from his milk. Colostrum contains five to

ten times more vitamin A than cow's milk, even though cow's milk is a rich source.¹⁰⁴

The requirement of thiamine or vitamin B₁ has been shown to depend on basal metabolism and caloric intake.⁸³ Since these are increased in pregnancy and lactation, the intake of thiamine would seem to demand an increase. There is practically no storage of this vitamin in the body. It stimulates appetite, tones up the muscles of the digestive tract and plays an important part in metabolism of carbohydrates. Ebbs, Tisdall and Scott¹⁰⁵ reported the changes which took place when the intake of thiamine was doubled or trebled in women who had been on poor diets. Many of the minor aches and pains and numerous complaints disappeared. The mental attitude of many of these patients changed from one of apathy and discontent to one of interest in the outcome of their pregnancy.

Riboflavin (vitamin B₂ or G) is associated with the oxidation processes of the cell. Its relation to pregnancy is not well established, although it has been proven to be essential for growth. With the increased metabolism during pregnancy, it seems probable that the requirement of this vitamin is increased. Riboflavin is found in milk, egg white, liver and leafy vegetables in such proportions that most diets should have sufficient amounts.

Niacin, (nicotinic acid, the pellagra-preventing vitamin) and pyrodoxine (vitamin B₆) have not been shown to have any particular significance during pregnancy except that the requirement is probably increased in proportion to those of other vitamins.¹⁰⁴

Ascorbic acid (vitamin C) is water soluble and is not retained in the body. Therefore, the level in the blood is directly affected by the amount in the diet.³⁶² Selleg and King³²¹ have shown that the amount of vitamin C in breast milk is dependent upon the dietary intake of the mother. Recent studies of Teel and his co-workers³⁶² show the need for an increased amount of this vitamin during pregnancy. The pregnant mother should give special attention to her intake of vitamin C during the late weeks of pregnancy and during lactation, especially if there are any periods when her diet is conspicuously restricted. If oranges, grapefruits, tomatoes and other fruits are a part of her daily diet, her requirement will probably be met.

The need for vitamin E in normal pregnancy has been suggested recently, and the use of wheat germ oil in threatened abortions has been reported as very encouraging.¹⁰⁴ However, proof con-

cerning the specific function of vitamin E in the human diet is not yet conclusive. It should not be difficult for the pregnant woman to get sufficient amounts of vitamin E because of its stability and wide occurrence in natural foods.

The administration of vitamin K to mothers just before the onset of labor or during labor has been shown to have a beneficial effect in preventing hemorrhage in the newborn.³⁶

Howe, in discussing the relation of the diet of the pregnant woman to the teeth of the unborn child, says, "The dentist may and should say to the medical practitioner that the teeth are calcifying and the bones which carry the teeth are undergoing ossification during fetal life, and it is his duty to see that the normal processes of growth and development here go on uninterrupted. It is recognized that these processes are influenced more strongly by nutritional states than by any other factor."*

Ebbs, Tisdall and Scott studied in their clinic a group of pregnant women who were found to have very poor diets. They divided them into two groups. "One group of 120 women on poor diets with low incomes were followed during the last half of pregnancy as controls for 90 women on equally poor diets and incomes, who were supplied with milk, eggs, cheese, oranges, canned tomatoes, wheat germ oil and vitamin D capsules, and who were instructed in the type of diet necessary for pregnancy. The observations made throughout pregnancy, during convalescence and on the baby showed a striking difference. The incidence of miscarriages, premature births and stillbirth, the number of infections in the mother and her general condition, both mental and physical, were much better in those who received extra food. Changes in the blood of the mothers given extra food gave evidence that they were in a better condition during the stress of pregnancy. The general condition of the babies born of the mothers who received extra food was much better than the condition of those born of mothers who were left on their poor diets. The incidence of illness among the babies was much greater in the poor diet group."†

Additional evidence of the relationship of diet to the health of mother and child is seen in the research work of Burke and her co-workers⁶¹ which shows that (1) there is a significant relationship between the diet of the mother during pregnancy and the condition of her infant at birth. (2) If the diet of the mother during pregnancy is "poor" to "very poor," she will in all probability have a poor

* Howe¹⁷⁵ (p. 373).

† Ebbs¹⁰⁴ (p. 400).

infant from the standpoint of physical condition. In the 216 cases studied by them, every stillborn infant, every infant who died within a few days of birth, with the exception of one, the majority of infants with marked congenital defects, all prematures and all "functionally immature" infants were born to mothers whose diets during pregnancy were very inadequate. (3) If the mother's diet during pregnancy is "excellent" or "good," her infant will probably be in good or excellent physical condition. However, it may happen occasionally (one out of 216 cases in this series) that the mother whose diet during pregnancy was "excellent" or "good" will give birth to an infant in poor physical condition.

There are many factors that contribute to a successful outcome of pregnancy, but it seems justifiable to assume that proper nutrition will guarantee a more optimum general health for the mother and will prevent or at least reduce the number of complications that may occur in pregnancy.

Calories, protein, vitamins and minerals are needed for good health in the nonpregnant woman. An additional supply of all these is important during pregnancy. Therefore, the selection of the daily diet of the pregnant woman requires knowledge and an understanding of her needs incident to her pregnancy if she is to maintain her body in the best possible physical condition. In order to supply the essential elements in the amounts recommended by the Food and Nutrition Board of the National Research Council, by the Washington National Nutrition Conference and by the Council on Food and Nutrition of the American Medical Association the diet of a woman during pregnancy should provide approximately: milk, 40 ounces (2½ pints); cheese, 1 ounce; butter, 2 ounces; egg, 1 serving; meat, 1 serving (liver once a week); potato, 1 serving; yellow or green leafy vegetable, such as carrots, spinach, chard, string beans or green peas, 1 serving; vegetables, such as cabbage, turnips or tomato, 1 serving; orange juice, 3 ounces, grapefruit juice, 4 ounces; or tomato juice, 7 ounces; other fruits, 1 serving; whole grain or enriched bread, 4 slices; whole grain or restored cereal, 1 serving. The extra calories necessary would be provided in other foods eaten during the day, which are dictated by her own food needs, preferences and tastes. A supplement of fish liver oil or its equivalent should be included to provide 400 to 800 units of vitamin D.

Elimination.—*Bowels.*—Food intake is one important aspect of the nutritional cycle. Another is elimination. The need of a re-

gular bowel movement cannot be too greatly emphasized. It is not a matter to be ignored until pregnancy occurs, for the establishment of a regular bowel movement at a regular time each day from early childhood is essential as a health measure at any time. During pregnancy, however, regular bowel evacuation is especially important as a safeguard against constipation. If, in spite of a well-established habit in regard to the bowel movement, constipation does occur, a woman may add certain laxative foods to her diet and increase the amount of water she drinks, taking a glass or two, preferably of warm water, on first rising in the morning to stimulate peristalsis. Exercise becomes even more important than before and she should keep up her usual amount unless for some reason the doctor has advised against it. Laxatives should *not* be taken without the doctor's permission as these may cause abortion.

The Kidneys.—The importance of the kidneys as excretory organs is increased during pregnancy. The patient knows herself whether or not her bowels are moving adequately each day, but she cannot tell whether or not her kidneys are functioning properly unless she reports to the doctor. He may want to know the amount of urine passed in twenty-four hours, and will also want a sample of urine at given intervals. The woman can help her kidneys function satisfactorily by eating a proper diet and by drinking plenty of water. At least six glasses should be drunk daily in addition to other fluid in the diet.

The Skin.—The skin, too, may be helped to do its work in a satisfactory manner. Through the action of the sweat glands, the skin always serves as an important excretory organ, and during pregnancy it has more work to do. In addition to the obvious perspiration, the skin is also constantly excreting waste products of which we are not conscious. A woman who seems to perspire more freely during pregnancy should not be troubled by it or attempt to stop it but should try to aid the activity of the skin by drinking plenty of water, breathing deeply, exercising and dressing warmly enough. A woman who becomes thoroughly chilled because she is not dressed warmly enough may seriously inhibit the action of the sweat glands, reduce the efficiency of the skin as an excretory organ and thus throw an extra burden on the kidneys. Daily warm baths, however, not only stimulate the skin and promote comfort, but also remove the accumulated waste matter. During the last six weeks daily showers or sponge baths are

preferable to tub baths because by this time it becomes harder for the woman to keep her equilibrium in a slippery tub and falling becomes a real risk. Tub baths may also increase the danger of infection at this time.

Fresh Air and Sunshine.—Plenty of fresh air, which we all know is important for healthful living, is another matter which should be mentioned when discussing the hygiene of pregnancy. The oxygen which a woman needs for herself and the growing fetus is taken into her lungs, and the carbon dioxide which has come from the fetus and from herself is given off from her lungs. She should take particular pains to keep the rooms of her house well ventilated and to get out-of-doors every day. Other reasons for getting out-of-doors every day are for exercise and sunshine.

Exercise and Rest.—Walking is an excellent way for a pregnant woman to get her exercise, since it brings into play and strengthens some of the muscles which will be active in labor. Exercise to which the woman is accustomed may usually be taken in moderation, but the risks of bad jolts, jars or falls must be considered, and exercises which incur any such danger should be avoided. Housework is also an opportunity for exercise during this period, and it is an excellent way to keep the muscles in good condition and to further the normal functioning of digestion and elimination. It is not, however, a substitute for exercise out-of-doors.

Overfatigue must be avoided, and one way of avoiding it is by taking plenty of rest. An extra rest each day and at least ten hours in bed each night not only are an insurance against fatigue but are also helpful in relieving pressure symptoms.

Clothing.—The clothing of a woman in pregnancy deserves consideration. No clothing should be worn which would in any way hinder the veins of the lower extremities from functioning as they should. Round garters should be avoided. As the woman increases in size, a properly fitting maternity corset may be worn which should support the uterus without binding and which can be adjusted to the changes in the figure. A brassière which supports the breasts, thereby giving relief from the discomfort of congestion, should be worn but it should not compress the breasts. A properly fitted brassière also aids greatly in maintaining good posture.

As the woman increases in size and changes her mode of walking to some extent, she may feel somewhat unsteady on her feet, and be conscious of the need of a firmer base on which to stand. She

may, therefore, need to change her shoes to a larger size with lower heels. But she must be sure that her arches are well supported, as her increased weight might cause a flattening of the unsupported arch. High French heels may be a cause of backache, as they tend to throw the pelvis out of alignment. Moreover, they do not support a woman as securely as lower, broader heels and are therefore likely to increase the danger of her turning her ankle or falling.

Care of the Teeth.—The old wives' tale, "for every child a tooth," has been disproven by modern scientists. It has been shown that shortly after the eruption of teeth the membrane through which calcium was taken from the blood stream disappears and that there exists thereafter no mechanism by which the blood stream can draw calcium from the teeth as it does from the labile stores in the ends of the long bones of the body. There is not even definite proof that pregnant women as a group have more dental caries than other women of like age. It is the belief of some, however, that mouth acidity may be increased during this period and that bacteria become correspondingly more active. It is usually advised, therefore, that a mild alkaline mouth wash be used frequently. It is strongly recommended also that any necessary repair work be done and regular trips to the dentist continued. The old idea that dental work causes miscarriage has no more basis in fact than that calcium will be drawn from the mother's teeth if she does not have enough in her diet to meet fetal needs.

Care of the Breasts.—"It should be the hope as it is the first duty of every mother to nurse her baby."* Good nutrition and general hygiene will contribute much toward the probability of being able to nurse the baby. Secretions of colostrum which tend to cake on the nipple during pregnancy should be removed with warm water and soap. There are many opinions, but definite knowledge as to what to do during pregnancy to prevent cracked nipples during lactation is lacking. However, the physician may have some new method and should be consulted concerning this as well as what to do during pregnancy if the nipples seem so flat that they will be hard to grasp when the infant is ready to nurse later.

Common Discomforts.—Any specific treatment for any of the discomforts of pregnancy, that is, anything beyond the general

* Prenatal Care. U. S. Dept. of Labor, Children's Bureau Publication No. 4, p. 15.

hygienic measures described above, should be undertaken only on the advice of the physician. Three of the commoner discomforts of pregnancy are nausea, heartburn and constipation. Constipation ordinarily responds to diet, exercise and fluids, and, as we have said, no laxative should be taken except on the advice of the physician. A number of cases of the successful treatment of nausea and heartburn with various members of the B-complex vitamins have been recently reported.^{159, 409} If further studies show the same results, treatment will become a matter of prevention rather than therapy.

Regular Examination.—Earlier in the chapter we emphasized the importance of good obstetrical care and of diagnosis by the physician as soon as pregnancy is suspected. Usually at the time of this first visit the physician will make a careful examination and, if he has not previously followed the patient, will take a complete history. The examination will include all laboratory and other procedures necessary to give the physician a complete picture of the patient's physical status at this time. He will probably want the patient to return monthly during the first seven months, every two weeks the next month, and every week thereafter in order to give positive direction on care during successive phases of pregnancy. He will also be alert to any adverse change in condition in order to institute treatment at once to avoid any serious complication.

PSYCHOLOGICAL CARE OF THE MOTHER DURING PREGNANCY

Emotional Disturbances.—The expectant mother in the past has had comparatively few avenues for learning about the physiology of pregnancy, the meaning and significance of her physical disturbances and the normal progression of pregnancy. This, no doubt, has been a contributing factor in one of the difficult problems with which physicians have had to deal in pregnancy, the undesirable psychological condition of some prospective mothers. Without the scientific knowledge that explains some of the symptoms and conditions peculiar to pregnancy, women have in the past often been dominated by fears, anxieties and insecurities. When a true sense of proportion about the basic adjustments of life has been lost in pregnancy, the resulting state of mind is sometimes enough to induce physical conditions which border on the pathologic. Selfconsciousness, undue scrutiny of body functions such as respiration and beating of the heart which go on auto-

matically, minute analysis of feelings and a tendency to introspection may lead to serious misinterpretation of conditions and sensations which are normal to pregnancy.

During the early months of pregnancy patients are most likely to be self-centered, and consequently to suffer from physical discomforts which are induced by poor mental health. Some women adopt a state of semi-invalidism and give way to nervousness, irritability, moodiness, fits of introspection and self-pity as part of their "rights" attendant upon their physical condition.

Need of Freedom from Emotional Strain.—In addition to living a satisfactory life from a physical point of view, it is most important that a woman should have a life as free from emotional strain as possible. Often circumstances which are in no way under the control of the woman precipitate her into an emotional situation which inevitably affects her. It should be borne in mind, however, that a regular physical regimen which helps to keep her in good physical condition should also help her to keep her balance emotionally. The relationship between the two is subtle, and each seems to react on the other, but whatever can be done to maintain a serene and happy atmosphere should be done. The emotional atmosphere of the home at any period in family life should be one of happiness and self-control dominated by a note of mutual consideration for the independence and happiness of each member of the family group. During the period of pregnancy the emotional life of the home should proceed as nearly normally as possible. There is some difference of opinion as to whether pregnant and lactating women should lead absolutely placid lives or not, but the general consensus is that a normally wide range of emotional experience will harm neither mother nor child. No woman should think that because she is pregnant she should stay at home all the time. She should continue her social pleasures as well as her work so long as it does not cause undue fatigue, and she should cut them down to the amount that will avoid fatigue rather than cutting them out entirely. A well-organized plan of living with a wholesome amount of recreation planned for and not undertaken spasmodically on the spur of the moment lessens the chances of fatigue, worry and the accompanying evils of irritated temper or depression. To sum up the matter in a few words, a pregnant woman should expect to live a normal, wholesome life, taking certain precautions to avoid mishaps. On the whole she should live about as any married woman lives who lives healthfully, avoiding

excesses of any sort but carrying on her ordinary work and play, and living a life which is satisfying to her, emotionally and sexually.*

PREPARATION OF OLDER CHILDREN

During pregnancy the woman has nine months in which to make her plans for the arrival of her baby and to make the readjustments in family life which may be necessary. If there are other children they must be prepared for the new baby in such a way that they will welcome him into their midst with pleasure. It is not always easy for the one who has been the youngest and has therefore had the position of baby in the family to see his position taken by another who must for many months, at least, absorb much of the mother's time.

Telling the Children.—Often children long for a baby sister or brother and welcome the news of an expected arrival with pleasure, but care must be taken that they do not get erroneous ideas of the baby. It is important to tell them the truth about the matter and to realize that their knowledge of a baby may be so limited that they may picture the advent of someone who will immediately begin to play with them. They must know that the baby will be little and helpless, will need much of mother's care, must be treated gently and may be a brother or may be a sister. They should know the truth about reproduction in simple but correct terms. It is not well to say that the baby is growing in mother's stomach, for example, for that is not the truth. The term that some people use in the effort to tell the truth, "growing beneath mother's heart" has a sentimental flavor about it which young children do not need. They accept quite simply and naturally the statement that the baby is growing inside mother's body in a special place meant for a baby to grow called the "uterus," if one wishes to give it its name. There is no reason why the statement should not be made to them and every reason why it should. They have a wholesome normal interest in the matter and they should have the truth. Indeed, the truth is much more logical to children than some elaborate fiction. If the mother is to go to the hospital when the baby is born, the children should know that. If the hospital is near by it is well for them to see it or some other hospital in order that they may have a feeling of familiarity about hospitals which en-

* Sexual intercourse is usually permitted by the physician throughout pregnancy except during the last two months and sometimes during the second and third missed menstrual periods.

genders a sense of security. They should not have the shock of wakening some morning to find that mother has disappeared in the night and gone to some strange place of which they know nothing.

Answering the Children's Questions.—Fear that children will talk makes people hesitate to answer their questions correctly, and often induces them to hush the questionings as if it were not right for them to ask. But if children are going to talk, it is better that they spread the truth among their friends than the untruths and unwholesome descriptions which they obtain furtively because their parents have forbidden their quite legitimate queries. The way in which parents answer their children's first question about the great and omnipresent fact of sex has much to do with the early attitude which the child will have toward sex. Those first patterns formed will possibly affect his whole outlook on sex and all its ramifications.

The matter of answering the children's questions about birth correctly is important not only from the sex point of view but also from another aspect, that of the need consistently to tell children the truth. The questions about the birth of a baby or of animals, which are usually asked at an early age, are often the first questions which parents are tempted to answer untruthfully. This is true partly because they themselves have not acquired the right attitude and so find it difficult to answer such questions simply and naturally without emotional color, and partly because they have not acquired sufficient scientific knowledge to give them the correct vocabulary or enough background to answer the questions in a simple but truthful way. To reduce scientific truths to simple terms which can be grasped by a child and which can be given in the amounts he is ready to receive presupposes a sense of assurance which comes from having a sound basis of scientific knowledge at one's command.

Whatever may be the cause for the untruths or half truths which parents so often give in answering these first questions about sex, the fact remains that this may be the first time when parents fail to be honest with their children. In this way the first lessons in untruthfulness may come from the parents themselves who complain a few years later of their children's tendency to falsehood. Another undesirable effect following a parent's attempt to hush a child's questioning is that a child thwarted in his normal desire for information may turn to undesirable sources, and may be less

likely in the future to go freely to his parents with his questioning. To prepare the other children for the new baby by telling them the truth is therefore of prime importance. It may be wise not to do this until the later part of pregnancy, as several months of waiting will seem unduly long to a child. Then too, since there is some possibility of a miscarriage, unnecessary disappointment to the children may result. It is well to delay the telling until obvious preparations are being made.



Fig. 11.—In a warm room even a baby as young as this one is not harmed by the exposure when his three-year-old brother assists with his bath. The three-year-old develops a strong sense of possession and responsibility which crowds out any possible feeling of jealousy.

Children's Share in the Preparations.—In the preparations for the baby and his care after birth the children should have some share so that they may have toward the new baby a sense of ownership and responsibility which will do much toward warding off any feeling of resentment or jealousy engendered by the great amount of attention the new baby will receive. The advent of a new baby must almost inevitably mean that the older children will seem to re-

ceive less attention than usual. Unless they are prepared for this in some way, they may resent it and feel unkindly toward the baby.

If there is to be some readjustment of rooms in order that the baby may have a room to himself, the children can help in making the change. The new baby clothes or those that have served the other babies may be arranged in the baby's bureau drawers or basket and the children thus learn how tiny and helpless the baby will be, needing the mother's attention for a long time after he is born. The crib can be seen by the children, and they may delight in helping make it up with the tiny sheets and blankets. They can, indeed, join in many of the preparations for the new baby, thereby learning in a normal wholesome way something about birth and baby care.

If the children have a special desire for a brother or sister, they must know that no one knows about that before the baby is born, and they must be prepared to welcome either brother or sister. It is important for parents to refrain from expressing their desires in regard to this matter too freely before the children lest the children reflect the attitude of the parents which is so often not as fixed an attitude as it seems to be. But a child may take the parents' expressed preference more seriously and so be less ready than they to make the adjustment to disappointment. If the child has been wanting a brother or sister and the new baby is of the opposite sex, often an opportunity to assist in naming the new baby creates interest and a sense of possession, and disappointment disappears.

OBSTETRICAL PERIOD

The Advisability of Hospitalization.—In preparing for the birth of the baby, one question which must always be decided is whether the baby is to be born at home or in a hospital. The tendency is for doctors to recommend hospitals if a good hospital is available, especially if it is a first baby or if there have been any symptoms of complications. The reasons for advising the hospital are: first, the hospital has absolutely all the equipment necessary for meeting any emergency which may arise; second, the hospital has additional trained people to call upon immediately in case they are needed; third, at the hospital there is every facility for giving the baby any special care it may need; fourth, at the hospital the woman will live a perfectly regular life during the postnatal period and will escape the consequences of any emergency which may arise in the home. One must bear in mind that there is as much

need for maintaining surgical asepsis during and after delivery of a baby as in a surgical operation. The hospital is prepared to make an aseptic delivery and thus minimize the danger of complications due to infection.

If the woman can go home in an ambulance and stay in bed after she gets home, the stay in the hospital need not be long, sometimes not more than a week. The hospital facilities are particularly valuable at the time of the birth of the baby and for the more or less critical first few days. The later part of convalescence can be taken care of satisfactorily at home. But good hospitals, although much more accessible than formerly, are not always available, and women sometimes feel that if there are other children, they cannot make satisfactory arrangements for them while away from home. Much can be done, however, in the way of winning the children's cooperation. If a reasonably satisfactory arrangement can be made for their care, it is a good time for them to begin to learn to stand on their own feet and live without their mother for a while.

One advantage of a home delivery is that the mother can have her baby in the room with her, and this has many advantages for both the baby and the mother. However, many pediatricians are interested in seeing such an arrangement made possible in the hospital also. When it is, the good obstetrical hospital or the obstetrical department separated from other departments of the general hospital will undoubtedly be the place of choice for delivery.

If delivery is to be at home, a list of supplies essential to a successful confinement at home should be gotten from the physician. Such equipment should be gathered together in one place about eight weeks before the baby is expected so as to be ready in case of a premature birth. If the delivery is to take place at home, the services of a well-qualified nurse should be secured, if possible, both for the time of delivery and for the postpartum period. If one cannot afford a full-time nurse, the services of a visiting nurse may be obtained in some communities, although rural communities especially are still seriously lacking in this respect.

How to Compute the Birth Date.—For the full development of the fetus, pregnancy must last approximately 280 days (ten lunar or nine calendar months). Although it is impossible to set the exact date for the expected birth, an approximate date may be reached by counting back three months from the date of the beginning of the last menstruation and adding seven days. For

example, if the last menstruation began on April 19th, the birth date might be expected to be January 26th.

The Beginning of Labor.—After about nine months of uterine life the baby is ready to be born, which means that the uterine muscles must begin to contract at diminishing intervals until the baby is expelled, a process which is called labor. Just what excites these muscles to begin the necessary series of contractions is not known, and it is still a question for which the answer must be sought by further research. However, when the uterus begins these contractions, the woman begins to feel labor pains, and she knows that the baby is about to be born. She should notify her doctor immediately. If the woman is to be at home, she should have the nurse with her, or if she is to go to the hospital, she will get directions from her physician as to when to go.

The Duration of Labor.—The duration of labor varies greatly from a very short time to thirty-six hours or longer. As a general rule the first labor lasts longer than labors which follow. It averages fifteen to eighteen hours. During the course of the labor, the neck of the uterus or cervix must first flatten and then dilate sufficiently to let the baby through into the vagina. The vagina, too, stretches from the small opening it usually is into a canal big enough for a baby to pass through; and the perineum, a triangular-shaped muscle between the vagina and the anus, must also stretch as the baby's head presses down upon it. Skillful handling on the part of the physician does much to save the perineum from tearing. Sometimes the perineum will not stretch sufficiently, and the physician may decide to cut it rather than to let it tear. In either case the perineum can be repaired immediately after the birth of the baby without undue discomfort to the mother.

Stages of Labor.—Labor is divided into three stages. The first and longest is preparatory and lasts from the first sign of labor until the time when the cervix is completely dilated. The membrane or sac which contains the baby and the amniotic fluid ("water") usually ruptures at the end of the first stage. During the second stage, the baby actually leaves the uterus and passes through the birth canal into the outside world. The third stage consists of a brief period of uterine contractions which serve to expel the placenta.

Position of the Baby.—The normal position of the baby in the uterus (Fig. 10, p. 89) is such that the head will be born first. The proportions of a baby's body are very different from the propor-

tions of an adult's body, the circumference of the head being slightly larger than the circumference of chest or abdomen. Hence, if the birth canal is large enough to let the baby's skull through, it is large enough to let the rest of the body through. One remarkable provision for facilitating the birth of the baby's head through the pelvic opening is that it is not like an adult skull, which is absolutely rigid and impervious to outside pressure. The bones of the newborn baby's skull are not firmly united by osseous tissue; instead, the baby's head has spaces between the bones. This not only allows for the increase in the size of the brain which will take place, especially in the first two years of life, but also permits a certain amount of molding of the head by the overlapping of the bones as the baby goes through the birth canal. This malleability of the skull, which adapts it to the opening through which it must pass, frequently makes a newborn baby seem to have a queerly shaped head, a condition which might seem alarming unless one understood its cause and realized that within a short time the skull would assume its normal shape. On the top of the baby's head at the meeting of the frontal bone and the parietal bones there is an open space between the bones, almost an inch in diameter. This is called the anterior fontanel, and it usually does not close until the baby is about eighteen months old. At the meeting of the parietal bones with the occipital bone there is another and much smaller opening called the posterior fontanel which closes in about two months.

Postpartum Care.—After the exertion of what is rightly called labor, it is important that the mother have a period of rest. Indeed, for the period of ten days or two weeks which is usually spent in the hospital, most women are content to be quite lazy, and interruptions for meals and nursing their infants prove quite enough diversion. Even visitors other than husband and mother can prove very fatiguing.*

* On this point Dr. Eastman has quoted from Francois Mauriceau, the Parisian obstetrician of the seventeenth century: "The Citizen's wives have a very ill custom, which they would do well to refrain, that is, they cause their Children to be baptized on the third Day after their labor; at which time all their Relations and Friends have a Collation in the Childbed Room, with whom she is obliged to discourse, and answer the Gossips, and all Comers a whole afternoon together, with the usual Compliments of those Ceremonies, enough to distract her; and tho' there is scarce any of the company which do not drink her Health, yet by the Noise they make in her Ear, she loses it." (Eastman, N. J.: *Expectant Motherhood*. Boston, Little, Brown & Co., 1942, p. 149.)

Recently, in many hospitals, because of the danger of infection of infants when visitors are allowed indiscriminately in the obstetric units, visitors have been limited to the husband and the two grandmothers, or sometimes just to the husband. Many women have admitted that it was a relief not to have to entertain visitors, and at least one study has shown that under such isolation (husband the only visitor), women were better able to nurse their babies. Darner and Hunter⁹² found, when 100 such women and their infants were compared with a control group of 100 mothers and infants under the same routine of care but without the ban on visitors, that the initial weight loss of the infants in the rest group averaged 79.3 gm. less than the average loss of those in the other group, and the babies in the first group received on the average 56.7 cc. more breast milk daily than those in the latter group. While sixty-six mothers in the control group were able to nurse their infants without complementary feedings, eighty-four mothers in the rest group were able to do so.

By the time the period of hospitalization is ended, many mothers feel rested and think themselves ready to tackle anything. However, the reproductive organs do not return to normal before six to eight weeks, and most mothers find that they fatigue very easily during this period. A practical nurse is a great boon if one is available and the family budget can afford her. The mother is much more likely to continue lactating sufficiently to nourish her baby and will regain her normal energy sooner if she can have some help during this period. Just how promptly she will pick up her usual activities will depend upon the advice of her physician. He will want her to return for a postpartum examination at the end of six to eight weeks. During the interim he will no doubt prescribe certain exercises to aid her in getting the abdominal muscles back to normal strength and the uterus back to normal position.

TOPICS FOR CLASS DISCUSSION

1. Have the class make a list of the facts which a consultant should have in her mind when she advises a pregnant woman concerning her diet. Let them translate their advice into a program for the pregnant woman, indicating quantities to be eaten. Then correlate the facts on which they base their advice, the program planned for the pregnant woman and the growth needs of the fetus.
2. Have some students make a study of the attitudes toward pregnancy that exist in different cultural groups and the possible implications of such attitudes on the health of the mother.
3. Draw on the experience of the class for examples of good and poor

mental health during pregnancy. Have them visualize the relation between the mind and the body. Discuss some of the problems in the family during the pregnancy of a mother which might cause her to be upset.

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The Child's Physical Equipment for Growth and Development

EXTERNAL DIMENSIONS AND WEIGHT OF CHILD'S BODY

The business of the young child is to grow. This impulse is so powerful that even under very adverse conditions growth takes place. A study of growing children must be as continuous as growth itself. It is, however, necessary to pause at intervals, to survey and evaluate what is taking place in a certain period of a child's life so that we may understand the child's needs and behavior and may provide the environment that will give him opportunity for optimum development. The question that arises immediately is what are the actual processes of growth and what is development itself. The most obvious and familiar aspect of growth is an increase in size; naturally this aspect was among the first to be studied by groups of scientists. However, no one who studies children can limit his observation to increases in stature and weight and length of legs in relation to the trunk of the body, because children begin to do other things—to crawl, to toddle, to babble, to talk. The increase in size is only one aspect of the changes occurring in the child's body as it grows and it is interrelated and interdependent on all other aspects.

In understanding physical growth there are certain terms used that express the concept and it is desirable to define these terms as they are used. The term "growth" designates one aspect of the process of growth which is evidenced by increases in size, weight and complexity of the functioning of the body. Development designates progress toward maturity in structure and function. It has to do also with internal changes in complexity and is inseparable from growth. The term "growth" and "maturation" are not interchangeable, although they are inseparable. Growth is increase in size and therefore in weight. Maturation and development (used in this text interchangeably) indicate increase in

complexity. Stages of maturation are defined as successive points in the growth of the child's body. Maturity, as commonly defined, is the end point of the process. "Pattern of growth refers to relationship of various measured characteristics within an individual at a given point in time or to a succession of changes with time."* A slow maturing pattern of growth may be used to indicate the total relation of the growth of the child's body to the growth of other children's bodies at a certain chronological age. Science of growth can speak with certainty about some of the sequences, rates and pattern of growths that have been studied. By sequences is meant those orderly series of changes that take place under the "impulse of growth." A child usually sits before he stands, stands before he walks.

Body Weight.—One of the most dramatic periods of growth follows the birth of the child. The size of the newborn infant is affected by sex, race, health and stature of parents. Because all of these factors influence the weight of a newborn, consideration of any child's birth weight is largely an individual matter. The weight of the mature newborn male child of European descent born in the United States averages $7\frac{3}{4}$ pounds and the average female child slightly less than $7\frac{1}{2}$ pounds. Normal full-term infants vary in weight at birth from 5 to $11\frac{1}{2}$ pounds. For boys roughly 10 per cent weigh less than $6\frac{1}{2}$ pounds, 80 per cent between $6\frac{1}{2}$ and 9 pounds, and the remaining 10 per cent over 9 pounds. In the case of girls 15 per cent weigh less than $6\frac{1}{2}$ pounds and 8 per cent more than 9 pounds. Infants weighing 5 pounds or less are considered premature or congenitally debilitated, and those weighing 3 or $3\frac{1}{4}$ pounds are grouped with abortions. It is the opinion of some investigators that the normal weight of 9 to $9\frac{1}{2}$ pounds may even indicate prolonged gestation or faulty excretory function upon the part of the mother or the fetus.¹⁵³

Nearly all babies lose body weight in the first three or four days after birth. This reduction in weight is due to loss of feces, urine, perspiration, exhaled moisture, vomiting, and to actual tissue loss. Approximately 1 per cent show no loss whatsoever; 6 per cent lose for one day only; 85 per cent lose for two, three or four days; the remainder lose for five or more days. Individual differences in the amount of weight loss range from no loss to a loss of $1\frac{1}{4}$ pounds. Average loss is 9 ounces or 7 per cent of the birth weight. Grulee's¹⁵³ studies confirmed these losses no matter what form of

* Olson²⁶⁹ (p. 3).

TABLE 2.—MEAN* WEIGHT OF CHILDREN FROM BIRTH TO FIVE YEARS (IN POUNDS)

	Boys						Girls					
	Year						Year					
	Birth	1	2	3	4	5	Birth	1	2	3	4	5
Harvard University ³⁷⁷	7.6	22.6	28.1	32.4	36.6	40.9	7.5	21.8	27.3	32.1	36.8	41.3
U. of Iowa ²⁷⁶	8.3	22.0	27.2	32.2	36.9	41.8	7.7	20.5	26.7	31.9	34.9	39.8
U. of California ³¹	8.2	24.1	29.8	34.8			7.4	21.6	26.9	31.9		
Fels Institute ³³⁷	7.7	22.0	27.8	32.2	36.6	41.5	7.5	20.9	26.3	30.7	35.1	39.7
Brush Foundation ^{328†}		23.8	29.1	33.5	38.4	42.8		21.8	27.5	32.4	37.1	42.2
Merrill-Palmer ³⁸²			29.6	33.1	36.4	40.8			26.9	32.0	35.3	40.4
U. of Minnesota ⁴⁵	7.3	22.9	28.3	33.1	37.5	41.5	6.8	20.2	26.9	31.6	36.2	40.3

* The results of the treatment of data that have been subjected to certain statistical procedures is expressed in terms of the mean which is the arithmetic mean and gives the average for the group of the particular measurement indicated.

† In the Brush Foundation Study it was found that both boys and girls make on the average a tenfold increase in weight from three months to seventeen years.

feeding was given. About one-quarter of the babies regain their birth weight in seven days; about one-half in ten days, and the other one-quarter in fourteen days. Heavy infants tend to lose a greater percentage of weight and to regain the equivalent of weight at birth less rapidly than light infants.²⁴⁸

Six months after birth the average body weight is about 17 pounds, or more than double the weight at birth. Individual differences for normal infants range from $11\frac{1}{2}$ to 26 pounds. Eighty infants in 100 weigh between 15 and 19 pounds.

At the end of the first year about twenty-five normal infants in 100 weigh more than 24 pounds, twenty-five others less than 20 pounds. Average weight approximates $21\frac{1}{2}$ pounds for girls and $22\frac{1}{2}$ for boys; the birth weight having been trebled.²⁴⁸

Average weight at two years for both boys and girls is 28 pounds or approximately one-fifth of average weight in early adulthood.

During the next three years, from two to five years of age, the healthy child gains 13 pounds. This is less than the amount gained in the first year of life.²⁴⁸

Studies conducted in various regions of the United States on more or less selected groups of children during the preschool years show the mean weights given in Table 2.

Body Length.—The term “body length” implies measurements with the child lying on his back in a horizontal position. The child at birth, if full-term, may measure from $17\frac{1}{2}$ to $22\frac{1}{2}$ inches; the average is 20 inches.²⁴⁸

Six months after birth the stature of the average infant is slightly more than 26 inches, having made a gain of an inch per month since birth. At the end of the first year normal infants vary in body length from 26 to 33 inches. The tallest 25 per cent measure above $30\frac{1}{2}$ inches and the shortest 25 per cent below 29 inches. At the end of the first year the average body length is almost 30 inches for boys and $29\frac{1}{4}$ inches for girls.

At two years the average body length is $34\frac{1}{2}$ inches, or slightly more than half the average height of adults. By four years the typical child has doubled his birth body length. The increase in body length between birth and one year of age is greater by one inch than the increase for the three years between two and five years.²⁴⁸

Studies conducted in the United States in various regions on more or less selected groups of children from birth to five years show the following mean body length:

TABLE 3.—MEAN HEIGHT OF CHILDREN FROM BIRTH TO FIVE YEARS (IN INCHES)

	Boys						Girls					
	Year						Year					
	Birth	1	2	3	4	5	Birth	1	2	3	4	5
Harvard University ³⁷⁷	19.9	29.7	34.7	37.9	40.9	43.4	19.7	29.3	34.2	37.7	40.6	43.4
U. of Iowa ²⁷⁶		29.6	34.0	37.5	40.4	43.4		29.1	33.6	37.2	39.9	42.8
U. of California ³¹		30.7	34.8	38.3				29.7	33.9	37.4		
Fels Institute ³³⁷	19.7	29.7	34.3	37.7	40.6	43.4	19.5	29.2	33.9	37.3	40.2	42.9
Brush Foundation ³²⁸		29.9	34.6	38.4	41.4	44.0		29.2	34.4	38.0	41.1	44.1
Merrill-Palmer ³⁸²			35.6	38.0	40.4	42.8			34.2	37.4	40.0	42.6
U. of Minnesota ⁴⁵	20.2	30.4	34.8	38.2	41.1	43.6	19.5	29.4	34.3	37.9	40.9	43.6

All Parts of the Body Do Not Grow at the Same Rate.—Of the linear dimensions, the measures of the leg length increase over the

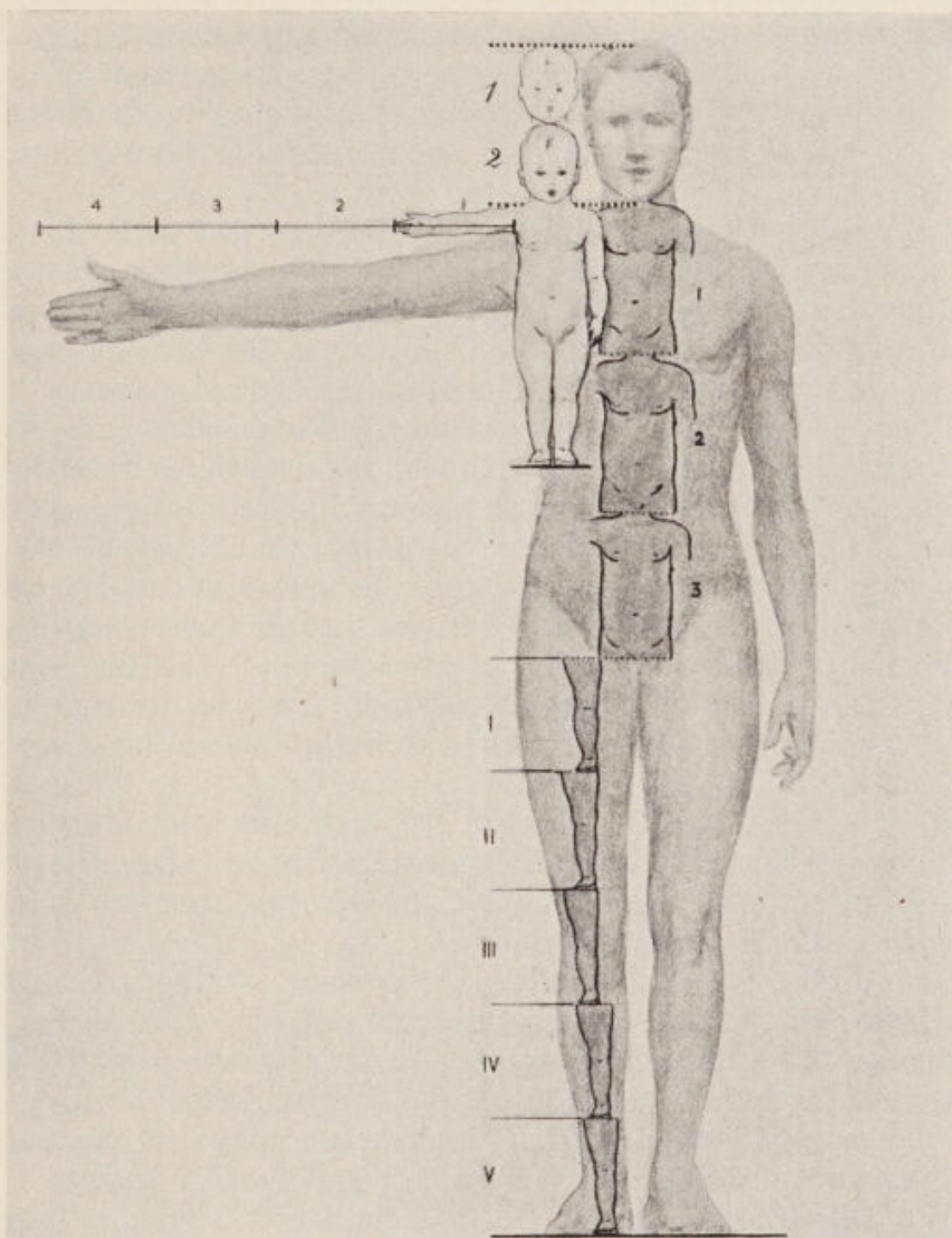


Fig. 12.—The proportions of a child are quite different from those of an adult. During the growth period the head doubles its size, the trunk triples its original size, while the arm grows four times as long and the leg five times, (Kahn: *Man in Structure and Function*, Vol. I. N. Y., Alfred A. Knopf, 1943.)

same age range at the most rapid rate. The rapid rate at which they grow causes them to contribute an ever-increasing part to the

body length. Early in prenatal life the leg constitutes 14 per cent of body length; at birth it constitutes 33 per cent; and by six years of age the percentage has risen to 45.³²⁸

The trunk length of boys at three months of age, using Brush Foundation Study measurements, constitutes 66 per cent of the total body length; at five years it constitutes slightly more than 57 per cent and at seventeen years of age it comprises almost 53 per cent.³²⁸

Early in prenatal life the length of the head and neck almost equal 50 per cent of the body length, while at six years of age it about equals 20 per cent. Simmons' study showed that both stature and the per cent of terminal stature attained are more closely related to skeletal age than to chronological age.³²⁸

Proportion of Mature Stature Attained in Preschool Years.—We are indebted to Simmons' study (Brush Foundation) for some very interesting facts which emphasize the importance of the preschool years in the attaining of height. This worker found that, between one and a half and two years, girls are one half as tall as they will be when they mature (about seventeen years); boys reach half their mature stature when they are one year older. At five years (the end of the period under discussion in this text) the girls will have attained about two-thirds and the boys three-fifths of their mature stature.

By nine months, both boys and girls will have reached half of the sitting height that they will have attained at seventeen. At five years they both will have about seven-tenths of their mature sitting height.

Rate of Growth.—Body length is composed of length of head and neck, the length of trunk and length of legs. Each of these components has its own pattern of growth. The rate of growth in body length is more rapid during the first year than during the second year, and more rapid the second than during the succeeding years covered in this text.

Sex Differences.—In the Brush Foundation study, girls at three months tend to weigh more than boys, but from three to eleven years the sex differences tend to be negligible.

During the period from birth to five years, as indicated by the studies which have been made, there is a slight tendency for boys to be heavier than girls at all age levels. It has also been found that "children from rural areas are heavier than children from urban areas; for children of German and Scandinavian descent to be

heavier than children of Jewish or Italian ancestry; for children of professional and managerial classes to be heavier than children of the laboring or semi-skilled classes and for children given relatively optimum dietary and health care to be heavier than children given less adequate care."²⁴⁸

Variability.—In the studies of growth which have been made, one is impressed with the wide differences recorded among individual children of the same age, sex, race and socio-economic status. They indicate, also, greater variability for weight than for height and an increase in variability with the period of rapid growth. It should be borne in mind that height is an irreversible characteristic (a child does not grow shorter) which is influenced by heredity, while weight can be increased or decreased by many environmental factors.

Need for Understanding the Structure and Function of the Child's Body.—Rapid and significant changes take place within the child's body between birth and five years which are not reflected by height and weight alone, and which influence his potential development as an individual. These changes, both structural and functional, occur in many of the systems of the body and mark the child's progress toward his own maturity. The child's body is his total equipment for action, for thinking, for purposeful living; it is delicately coordinated and dependent on the functioning of the various systems that compose it. In order to understand growth and development one must know the structure and function of the different parts of the body and their interrelationship. Since the feeding, care and training of young children are based on the knowledge of their bodies and their stage of maturity at the various age levels, there can be no adequate understanding of certain procedures followed without this basic information. To make this period of dramatic physical change become real and vivid to those interested in child development, a brief review has been made of the systems of the body and their development during the first five years of life.*

The digestive system will be treated in detail because it is the portal of entry of food and without food life cannot continue,

* Some of the systems of the body, in their service to the body, are not completely understood; others are the subject of current research. Some are understood in their function at the adult level but have not been explored at the early childhood level. The facts that are pertinent to the discussion of the growth of the child in the first five years of life will be reviewed.

and unless its functions adequately normal development does not take place; also because of its close relationship to the well-being of every tissue in the body. The efficiency of the functioning of the digestive system is reflected in the health of the body.

The skeletal system was selected because it constitutes the framework of the body; its increases can be measured in height units, and by means of roentgenograms a picture can be secured of its stages of maturity. It is to be remembered that all systems of the body are interdependent, and the stage of functional maturity of one system is in part reflected in the stages of maturity of the others. For example, the immaturity of the neuromuscular mechanism is reflected in the activity of the digestive tract. It is our desire to present in this chapter the physical potentialities with which the child starts life when he is born and how far he has progressed toward maturity by his fifth year.

The transition of a human being from a dependent life inside an amniotic sac within the uterus of the mother to an independent existence in an outside world necessitates prompt and extensive readjustments for the newborn. With almost no effort on his part he has received all that was necessary to maintain life from his mother's blood stream and excreted his waste products through her. When the cord is severed and dressed, he leaves quite suddenly this sheltered environment and his dependent existence and begins to breathe for himself. The lungs must be functionally perfect in their mechanism when the first breath is taken and the whole respiratory mechanism must be set immediately in motion; at the same time circulation must be altered so as to pick up oxygen from the lungs and food from the intestine, and the latter must be distributed to the body tissues if the child is to live. He must take his nourishment in a more complex form and digest and absorb it; he must learn to eliminate feces and urine and accustom himself to sound and light. To him it must be a strange, new, complex world.

SKELETAL SYSTEM

A child comes into the world with a body which consists of a rigid framework of bone held together by muscles and tendons, which together with the enveloping skin supports, surrounds, moves, and thereby protects the delicate organs essential for the maintenance of health and activity. The framework takes about twenty years to grow and develop its full potentialities. Each

organ, if it functions at all, must function to full capacity, harmonious with the changing needs of the growing body. Since the skeleton is a structure which takes a long time to reach maturity it has characteristics which afford excellent examples of stages of maturity which the individual reaches at all ages. Any study of the skeleton must contemplate three aspects, namely, bones as supporting structures and agents in locomotion; bones as a source of mineral, particularly of calcium for utilization in blood coagulability, muscle tone, kidney function and activity of central nervous system; and bones in their role of blood-forming organs through the agency of red marrow.

Bones of the Newborn.—The skeleton of the embryo is laid down either in cartilage or in a membrane of connective tissue. The patterns of all bones are laid down in the cartilage. The process of replacement of cartilage by bone begins in early embryonic life as soon as the cartilage has formed, and continues until the skeleton has reached full maturity. The bone of the newborn consists of cartilage, mineral salts, fats and water. "There are small crystals of an inorganic compound, yielding on analysis chiefly calcium and phosphorus as phosphate imbedded in a matrix of the protein ossein." "Calcium phosphate composes about 58 per cent of the weight of the bone, calcium carbonate about 7 per cent, calcium fluoride and magnesium phosphate from 1 to 2 per cent each and sodium chloride less than 1 per cent. They confer on bone its hardness and rigidity, while the animal matter (ossein) determines its tenacity."*

How Bones Grow.—In the cartilage and membranes which are replaced by bone, mineralization starts at one or more points, called ossification centers, from which it spreads gradually throughout the bone. Bones grow in width by adding new bone at the outer edges underneath the periosteum, and long bones grow in length by continually replacing the cartilage there. Curiously and interestingly enough, long bones do not continue to add to their length by adding on bone only at the ends. Shortly after birth a second deposit appears in the cartilage near the end, and this separate deposit continues to expand too, independent of the first part, and is separated from it by a strip of cartilage. Finally the two parts unite, eliminating the cartilage strip. The second deposit is called an epiphysis. The original deposit is called the shaft, or diaphysis.

* Gray¹⁴¹ (p. 85).

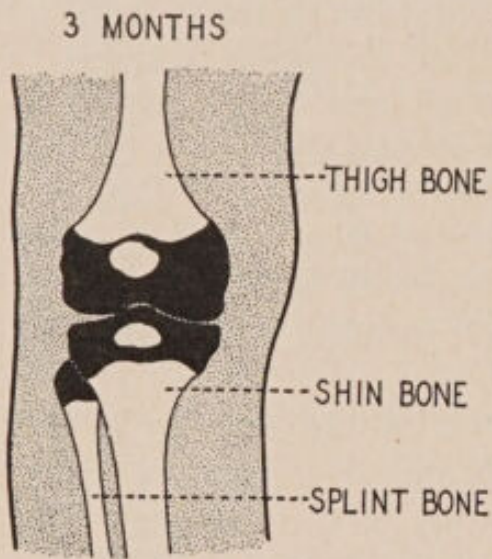


Fig. 13.

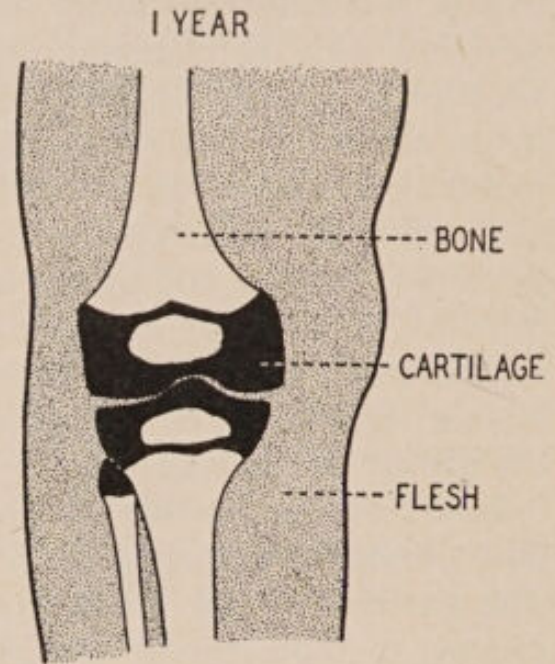


Fig. 14.

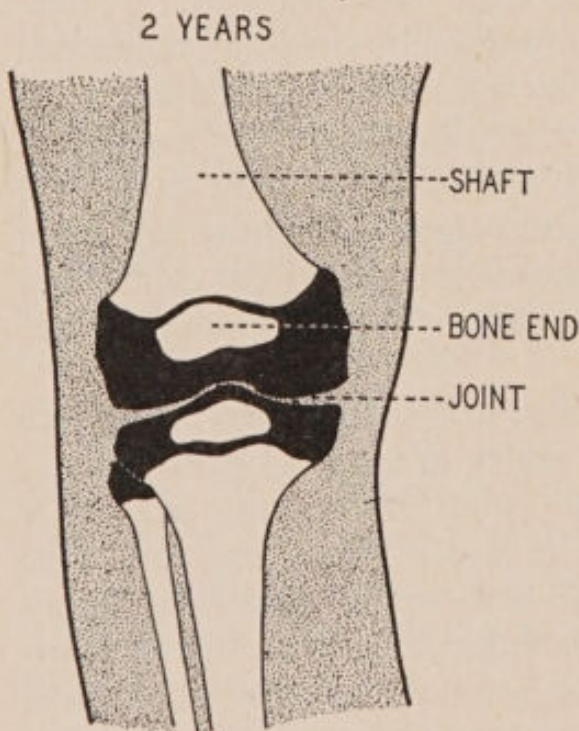


Fig. 15.

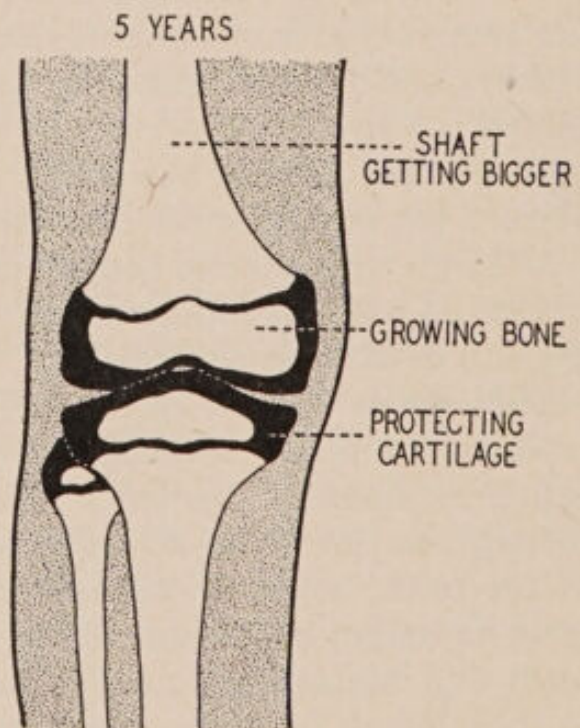
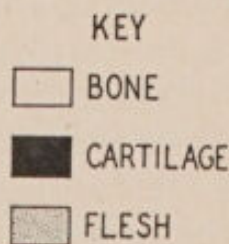


Fig. 16.



Figs. 13, 14, 15 and 16.—Ossification of male knee. (Francis: Fundamentals of Anatomy, C. V. Mosby Company.)

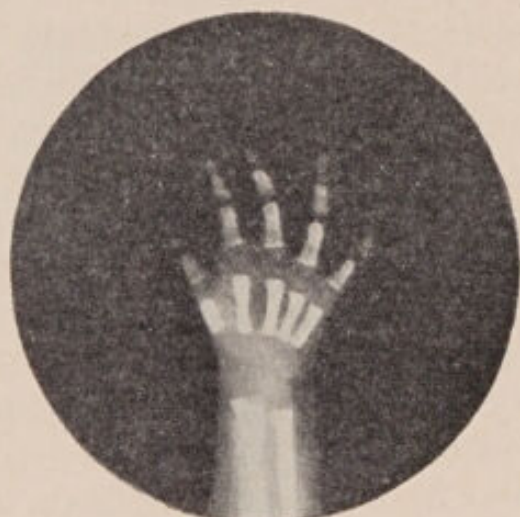
Approximately 800 of these points or ossification centers exist, more than half of them appearing after birth. It is by means of the known average time of appearance of these centers that skeletal age in the early years and the stage of maturation can be determined by x-ray examination. The growth of the bones in the hand is considered by many to be representative of the growth taking place in the skeletal structures as a whole. The changes in density of these bones, too, are considered to be quite representative of the generalized changes throughout the body. Bone development of the body can be evaluated by the study of an x-ray picture of the hand. Two methods have been used in reading the x-ray: (1) the measurement of the shadows on the film which represent the bony areas and hence give a measure of the amount of bone; (2) an inspection and comparison with a standard x-ray picture of the contours of the ends of bones and the epiphyses and the progress toward union of the epiphysis with the shaft of the bone. The latter method is the one generally used and most useful clinically because bones are irregular in shape and no single dimension reveals its size completely. The standards for some bone measurements during growth have been worked out by Baldwin and his coworkers,²⁰ by Stuart and his collaborators.³⁵⁵ The standards for the second or inspectional method are those of Todd^{369a} and Flory.¹¹⁴

Determining Skeletal Age.—Skeletal development is expressed in terms of skeletal age. "The concept of skeletal age is based on an aggregate of multiple maturity factors."* The essential fact to note, as emphasized by Todd,^{369a} is the child's progress toward maturity rather than his status at the time of the x-ray. If, for example, in six months his skeletal age has progressed six months, then his progress in skeletal age is keeping pace with his progress in chronological age. If, on the other hand, he has progressed only two months in skeletal age during the same period, his skeletal growth is lagging behind. If he has gained nine months in skeletal age during this six-months period then his bone growth has been accelerated. The slow rate of skeletal maturing may be the normal pattern for one child, just as the accelerated rate of maturing may be the pattern for another.

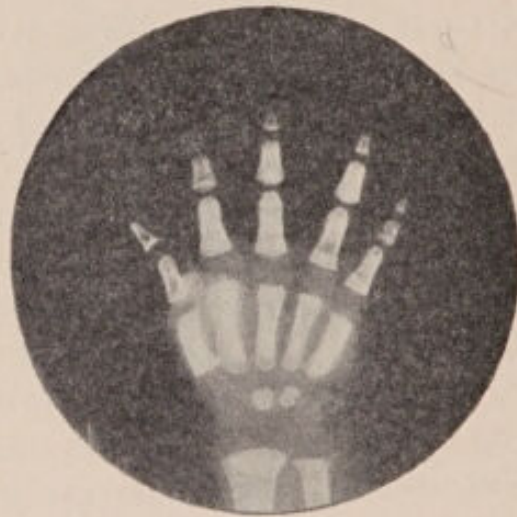
At birth the child has none of the epiphyses in the hand and no bones in the wrist. By one year two carpal centers and some of the epiphyses have appeared. Between three and four years all of

*Buehl and Pyle⁵⁸ (p. 335).

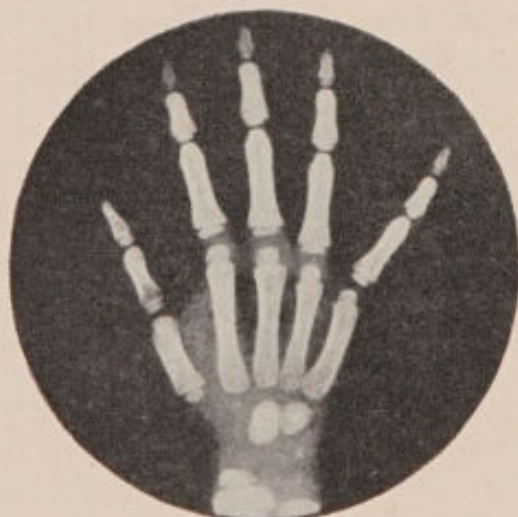
the epiphyses of the metacarpals and phalanges usually have bone centers, and two more carpals have been added. By five years of age all the epiphyses except one have formed an ossification center.²⁸⁵ Some normal children at these ages may have more centers, some entirely normal children may have less. Girls are further advanced than boys. For example, the fifth carpal bone that does not appear



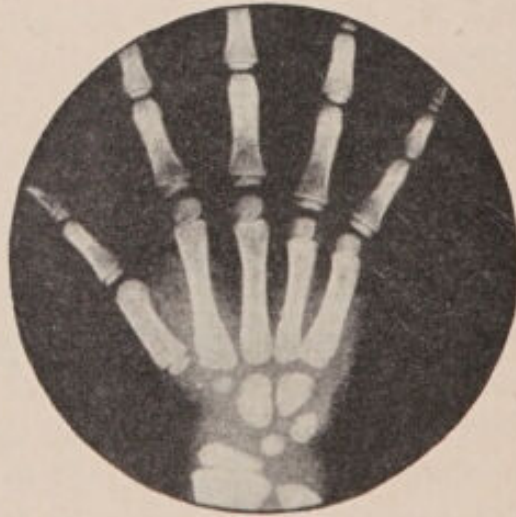
Birth.



1 year.



3 years.



5 years.

Fig. 17.—The bones of a child's hand from birth to five years of age. (Engelbach, William: *Endocrine Medicine*. Springfield, Ill., Charles C Thomas.)

in boys until an average age of sixty months appears in girls at the average age of forty-eight months.

The bones and epiphyses appear in an orderly manner. By the fifth year the wrist bones have not only increased in number but have grown in size, and some of them have taken definite shape (see Fig. 17). During the elementary years these changes continue,

and as the bones grow the cartilage fills in and in the roentgenogram the spaces between them become smaller. X-ray pictures of the infant's foot also give evidence that is valuable in interpreting his stage of maturing.^{285*}

The bones of the body not only serve as a framework to support the body, but they are storehouses of minerals from which the blood can obtain substances essential for the life and health of the cells of the body. The spongy part of the epiphysis is a network of bony trabeculae (a row of cells bridging an intercellular space), the size of the mesh having a family pattern, but liable to undergo modification in any individual from time to time. In health the interstices (open spaces) of the mesh are well filled with labile mineral. This is the floating store from which the mineral is obtained for blood coagulation, muscle tone, kidney function and stabilization of the nervous system. When the body draws upon the bone for mineral, two modifications may occur in the network of trabeculae and the enclosed labile mineral, which is best expressed by the metaphor, "snow-covered chicken wire," employed by Todd. "As the snow filling the interstices melts, the chicken wire mesh becomes more plainly visible and parts that have suffered corrosion stand out as breaks in the mesh. But if the melting snow freezes afresh, the trabeculae become coated with ice. They may not appear thicker but will stand out more clearly and the places where the wire strands of the mesh are intertwined will appear as nodes in the network. Spongiosa well filled with mineral corresponds to the snow-covered net of chicken wire. Withdrawal of the labile mineral corresponds to the melting of the snow. Breaks in the trabeculae represent a heavier drain on the stored supply. Transformation of labile mineral into the more stable phase corresponds to the ice-covering with knots or nodes in the network." †

Density of Bone.—Not only the appearance and shape of the bones of the hand are shown by the x-ray picture but the density of the bone can be revealed by the depth of the shadow. The density of bone may vary at different periods during development. Studies of consecutive x-rays of children show that in some well children there seem to be times when the bones become less dense. Such a period is often noted around eighteen months and again at adolescence. Todd says: "So frequently do we find lightly mineralized bones in the highly strung child, who is prone to

* See under *The Foot*, p. 133.

† Todd^{369a} (p. 28).

fatigue, restless, often very alert, irritable, poorly adjusted, apprehensive and fearful, with deficient powers of attention and concentration that we have come to suspect deficiency in mineralization as the physical counterpart of this emotional maladjustment. But one should point out that one is dealing here not with cause and effect but merely with different aspects of a constitutional handicap."*

Bone Scars.—Bones also record metabolic disturbances due to infectious diseases, gastro-intestinal disorders, illnesses and allergies. These disturbances are marked by scars in the form of transverse lines on certain long bones which indicate that normal growth has been interrupted.^{107, 158, 209}

Differences in Skeletal Development.—Children differ in skeletal development as they differ in height and weight, although the process of maturation is less subject to fluctuations than is that of growth. Differences between the skeletal development of boys and girls are present at birth and increase as the children grow older. There is evidence that heredity influences the pattern of bone growth.²⁹⁰

Skull.—Between the sixth and the eighth week of fetal life the skull bones which form in the cartilage of the base, begin to ossify. At birth the base of the skull is well ossified, as are the bones of the face. In the vault of the skull there are large areas of cartilage which are unossified, known as fontanel. The largest one lies in the midline between the two parietal bones and the frontal bone. It is diamond shaped and is called the frontal fontanel (commonly known as the soft spot). In the midline between the parietal bones and the occipital there is a smaller area called the posterior or occipital fontanel. There are several other small fontanel. The posterior fontanel usually closes between the fourth and eighth week and is seldom more than 0.5 cm. in its largest dimension. The unossified areas are replaced by bone, usually by eighteen months. During infancy the skull grows rapidly to accommodate the brain which is increasing steadily in size.

At birth the brain-case has a capacity of 350 cc.; this increases to 750 cc. by one year of age and to 900 cc. by two years. The brain reaches its approximate adult size of 1500 cc. by six years and in well-grown children it may be practically adult in size by four and one-half years. Thereafter the increase in the size of the brain-case is very minor in amount.

* Todd³⁶⁹ (p. 149).

Head.—At birth the head of a child measures 12 to 14 inches in circumference, there being a slight difference between boys and girls. During the first year the circumference of the head increases approximately 4 inches, but in the second year only 1 inch.³⁸⁴ In proportion to the size of the body the head is just about twice the size of the average adult head. The upper portion of the face is much more completely developed than the lower. The orbits are large and rounded with sharp margin. The nasal aperture is large, broad, and rounded, and the inferior nasal spine is well marked. The upper and lower jaw are broad and shallow. They

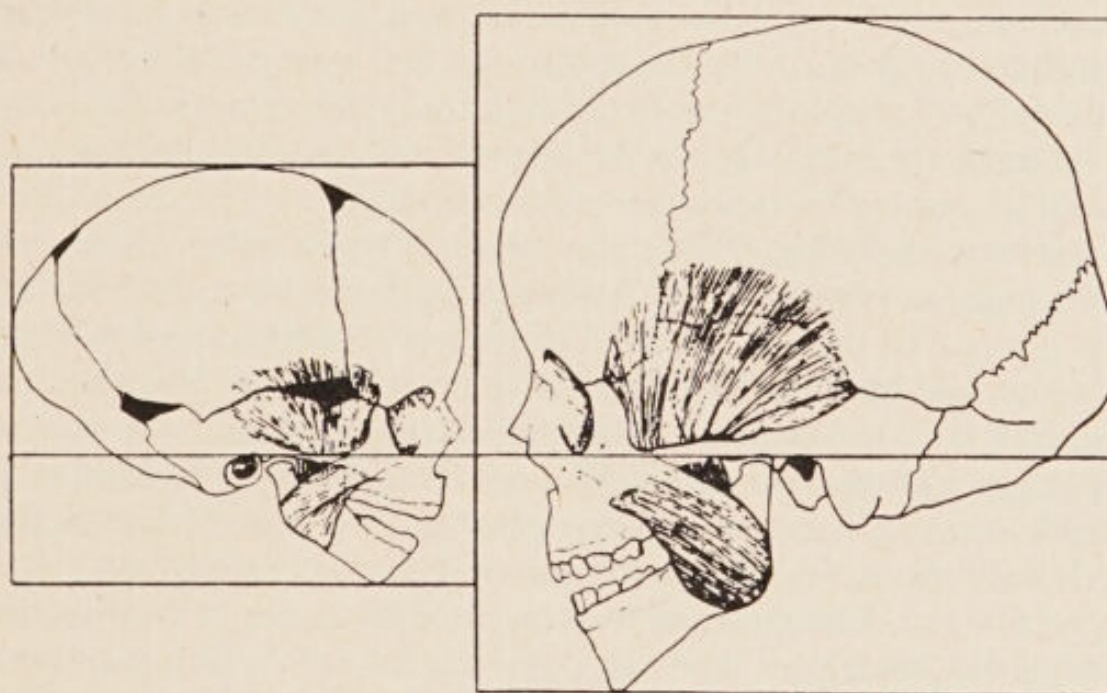


Fig. 18.—Skulls of newborn child and six-year-old boy drawn in their natural proportions. (Brash, J. C.: *The Growth of the Jaws, Normal and Abnormal, in Health and Disease*. London, The Dental Board of the United Kingdom.)

present a series of rounded elevations that contain the dental sacs of the temporary or deciduous teeth. (Jaw development is discussed under *Teeth*, p. 164f.) The bones of the face grow steadily but relatively slowly until the late teens. This is in contrast with the cessation of growth in the brain-case in earlier childhood, but is due to the need for increasing the size of respiratory passages, jaws, and permanent teeth. The early growth of the brain-case results in its relatively large size as contrasted with the small face.

Part of the increase in the size of the face during childhood is due to the development of air sinuses. The antrum and ethmoids

grow rapidly during the first two years. The average age at which either frontal sinus was definitely evident above the nose and at which it began to increase in size was calculated as three years, although this is a difficult evaluation to make, and the age may vary widely.

Since the sinuses are not visible at birth in the x-ray of the skull, their growth as revealed through roentgenograms could be considered as one of the maturity indicators of the head.

Thorax.—The chest is barrel-shaped in infancy and the downward slope of the ribs is less pronounced than it is in later childhood and in adult life; its circumference at birth is from 12 to 14 inches. It is of interest that the circumference of the chest is slightly less than of the head. By the end of the first year the chest circumference is 17 to 19 inches, being slightly larger than the head.

At birth the sternum is a flexible strip of cartilage containing a variable number of centers of ossification.³¹²

Vertebral Column.—The spine or vertebral column of the newborn is a flexible structure. Before the child is born his head and legs are curved toward the front of the body and his spine is, therefore, curved like a "C." When he is born he must breathe; that requires that his head be raised from his chest and the cervical spine (neck) begins to assume its individual form of curvature. As the child learns to sit up and learns to balance himself for standing and walking the normal curvatures of the spine develop. From these normal curvatures as well as the differences in contour and size of the vertebrae we have come to recognize four regions in man, the cervical, thoracic, lumbar and sacral. The cervical and lumbar parts of the vertebral column are free in that they are not attached to other bones, whereas the thoracic spine articulates with the ribs, and the sacral region articulates in a more limited fashion with the pelvis. The head rests on the cervical spine.

At birth the spine is largely cartilaginous just as the bones in the arms and legs are largely cartilaginous, but the spine becomes less flexible as the child grows older both because the cartilage is replaced by bone and its motility is limited by its function, namely, that of maintaining the body in an upright position.

The ribs of the fetus are important and their ossification begins very early in fetal life but is not completed until about the twentieth year. They not only enclose the lungs, but the accessory muscles of breathing as well as the diaphragm are attached to them. These facts are significant in the discussion of posture (see p. 138 ff).

The average length of the thoracic part of the vertebral column in the newborn is 19 to 20 cm. (8 inches). It is equal to approximately 40 per cent of the total body length. During the first year it grows rapidly, increasing to 45 cm. (18 inches). Thereafter the growth becomes much slower, only attaining a length of 50 cm. (20 inches) at puberty and 60 to 70 cm. (24 to 28 inches) at maturity.³¹² Learning to sit and to walk may put a temporary strain upon the muscles and the soft tissues attached to the bone, and it is desirable to prevent young children from becoming exhausted in the pleasure they have in this new skill.

Pelvis.—The pelvis of the child consists of two sets of three bones (ilium, ischium, and pubis), one set on each side which unite at twenty years to form a single hip bone. The two hip bones, bound together with the sacrum by strong ligaments, form the pelvic girdle which supports the weight of the body on the legs. Within this circle of bone lodges the urinary bladder, the lower end of the large intestine, the organs of reproduction of females and the large vessels and nerves to the lower extremities and it serves as a protection to them.

The pelvic cavity of the newborn is much smaller relatively than in the adult and is more horizontal in position. During the first two years the pelvis grows rapidly in all dimensions; from this period until ten years the rate is much less rapid³¹². In infancy and early childhood the pelvis consists of a number of separate bones held together by ligaments. The change in gait evident at about the age of three results from a widening of the pelvic girdle and an increase in the relative length of the legs. The differences in the skeleton due to sex are evident in the pelvis at birth. Aside from difference in size, the sexual differences disappear during the period of early rapid growth and do not reappear before ten years of age.³¹²

Extremities.—The arms are relatively shorter than in the adult. The clavicle (collar bone), the first bone in the body to ossify, is short and therefore helps to produce the narrow sloping of the shoulders of the infant. The radius and ulna of the forearm are more nearly equal in thickness than in the adult. The hands of an infant are quite different from those of an adult; the fingers are relatively shorter and stubbier. The shape and size of the hand changes gradually as the child's body grows.

The legs of the newborn are short and flexed and the soles of the feet are directed toward each other. As the infant grows his legs

straighten. The foot of the infant is characteristic of his stage of development and is flexible, relaxed, and more mobile than that of an older child. The arches are much less rigid in infancy than at later periods of growth. In the bottom of the foot is a fat pad which gives the appearance of "flat footedness." Even after the child has started to walk the ligaments are relaxed and the large muscles, not yet accustomed to maintaining balance, are unable perfectly to carry out their new task. The feet are therefore held widely apart in order to widen the base of support and there is a tendency to "toe out." This throws the weight on the inner side of the sole of the foot.

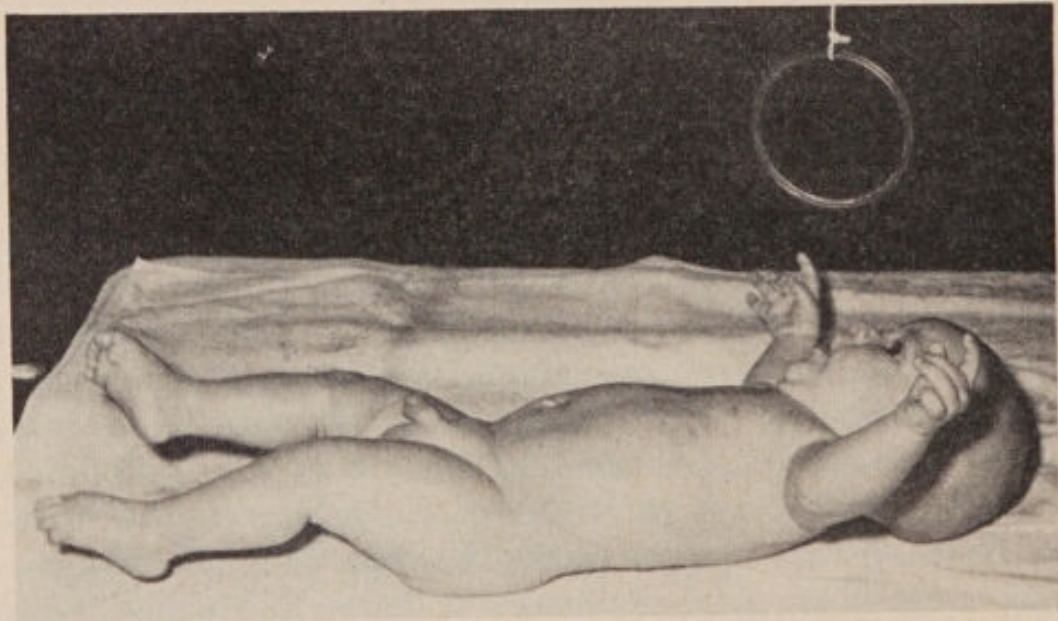
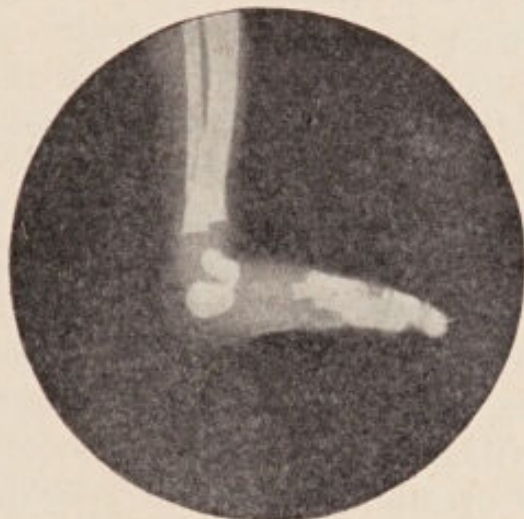


Fig. 19.—This child of four months illustrates body proportion: size of head in relation to total length; the length of trunk compared to total length. It also shows McGraw's Stage C of reaching—prehensile behavior: his eyes are fixed on the ring, and he is active, but his reaching is purposeless and will not obtain the ring for him.

X-ray pictures of the foot of the newborn show two tarsal centers; for boys at one year of age there are four tarsal centers; at three years of age there are eight epiphyses and the fifth tarsal center has developed; at five years all seven of the tarsal bones and all of epiphyses of the metatarsals and the toes have appeared.²⁸⁵ Ossification in the feet of boys lags behind that in girls. Soon after the practice of walking is established the relative position of the bones in the arch takes on their characteristic individuality, i.e., low or high arch. Although much of the bone is still in the cartilaginous state the adult characteristics of the child's arch are fore-

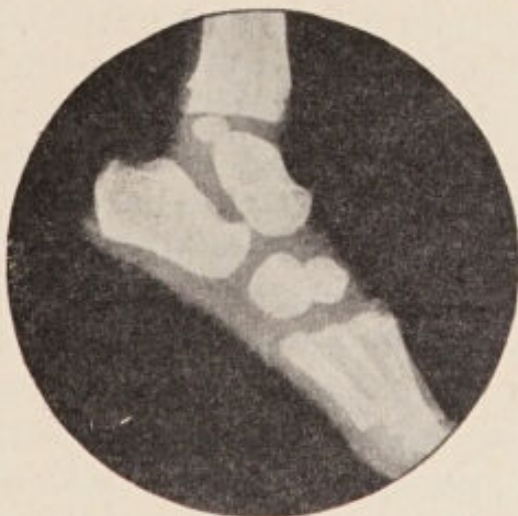
cast. Whatever modifications there are thereafter are largely due to injury or reduction in muscle tonus and the like. From the facts revealed by studies it has been concluded that as early as five years there is a strong genetic component revealed by the shape of the arch.³⁰⁶



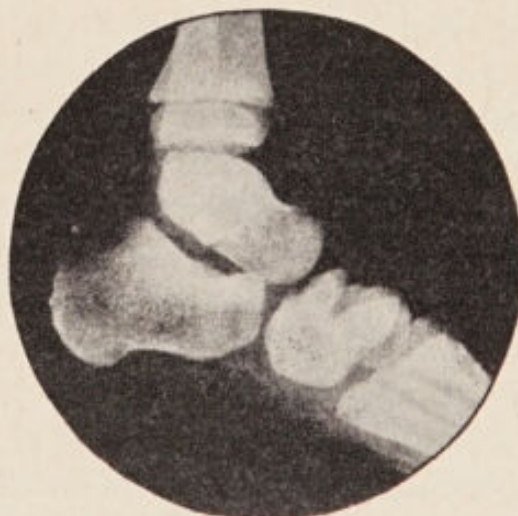
Birth.



1 year.



3 years.



5 years.

Fig. 20.—The bones of a child's ankle from birth to five years of age. (Englebach, William: *Endocrine Medicine*. Springfield, Ill., Charles C Thomas.)

Bone is a living, growing, labile tissue composed of living cells which participate in the functioning of the body and contribute their part to its well-being. The bones support the structure of the body, determine its stature and help with overlying soft parts to determine its physique.

The skeleton indicates the body's progress toward maturity throughout childhood. It reveals for a long time afterwards by its

scars whether a given illness or an environmental factor has reached into the child's body stores.

Bones are the storehouses of the minerals of the body, especially of calcium, which is necessary in blood coagulation, insuring good muscle tone, kidney function and maintaining the stability of the nervous system. However, as a blood-forming organ, bones, through their red marrow, perform an indispensable service to the entire body; in turn the bone itself is dependent upon the functioning of the nervous system, the blood vascular system as will be seen later in the chapter.

RESPIRATORY SYSTEM

One of the first acts of the newborn is to breathe. Nature has provided him with a respiratory apparatus consisting of a nose, larynx, trachea, bronchi, and pleurae, together with the diaphragm and the large and small muscles which are attached to the ribs and which aid in the mechanics of breathing. It is now believed that respiratory movements begin late in fetal life, in the absence of actual respiration, and at birth there is sufficient inflation of lung tissue to enable the infant to sustain life. The remainder of the lung tissue expands gradually during the next several weeks. Weakness of the muscles of respiration, decreased irritability of the respiratory centers, and lack of coordination of the newly assumed respiratory mechanism all help to explain the shallow, rapid and irregular breathing of the newborn.¹⁵³ With increasing age the respiration grows deeper and the mechanism works more economically and shows greater elasticity. The rate decreases from approximately anywhere between 20 to 75 per minute at birth to 20 to 45 at one and two years of age, and to 30 at four to five years. These rates vary considerably in children of the same age and size. There is likewise fluctuation within the same child from time to time. The rate of respiration is one of the symptoms watched by the physician, since it is through the act of continuous respiration that the body receives much of its oxygen supply, and the small amount held within the living tissues is exhausted very quickly when air is cut off.

The amount of air entering and leaving the body with each respiration increases with age. At one year the amount is 48 cc.; between three and seven years it is 124 to 221 cc., or little less than half the adult would inhale. The smaller intake is compensated for by the more frequent breathing.

The type of respiration changes as development proceeds. At birth and during the first few months respiration is essentially abdominal.* Changes toward the adult type of thoracic breathing begin when the infant sits up and should be normally well under way by two years. Somewhere between three and seven years the combined abdominal and thoracic type of respiration is established.

Persons who carefully observe children are giving more consideration to the ability of children to breathe adequately because the blood stream must "pick up" the constituents of the air which the body needs and transport them to all parts. It must return the waste products to the lungs which in turn "pick up" the carbon dioxide, volatile nitrogenous products and the like and clear them out of the body by the act of expiration. The function of the respiratory system has a profound influence on body dynamics and if we are to understand calorie requirements and heat regulation of the body, it should be thoroughly visualized. It should be remembered that respiration cannot be controlled by the kind of air we breathe or the composition of the blood stream which has been altered by body wastes, although these are closely related to body dynamics. It is true that excessive carbon dioxide and nitrogen may deter momentarily the rate of respiration and even oxygen in inhaled air may alter the rate; however, the human body cannot long survive if the respiration rate is altered unless the respiratory system rapidly adjusts and returns to its regular rhythm.

Basal Metabolism.—For many years it was difficult to determine the amount of energy required by the child's body to maintain his body temperature, the functional activities of the several organs and the electrical exchanges. The chemical changes incident to these changes are included in the term "metabolism." These reactions are, in the last analysis, the result of oxidation and their sum total is expressed accurately by the amounts of oxygen taken up by the lungs and of carbon dioxide liberated by them. This is measured by a calorimeter and the energy exchange is expressed in heat units, i.e., calories, produced per hour, and is proportionate to the surface area of the body. When the body is completely at rest, comfortably warm and without the stimulating influence of food, it is considered that all the heat generated by the individual is due to the activities of the internal organs (heart, blood vessels, alimentary canal, glands, etc.), and to the "resting metabolism"

* The abdominal type of breathing is due to the structure of the diaphragm and the ribs.

of the cells. This is called "basal metabolism," and registers the status of the body. Since this forms the basis for the calculation of the calories required by the child it is of especial significance in these early years.

The periods of rapid growth, of which the first year is one, are associated with a greater increase in heat production than at other times. Since the child's requirement for more energy is indicated it is possible to meet his needs in these periods with adequate amounts of food based on reliable scientific information. Without the basic knowledge given us through determinations of the basal metabolic requirement this could not be done with the same accuracy. It has been found that heat production increases with increasing age, as long as growth continues. In children individual differences and deviations from the average are greater than in adults. The younger the child the greater the normal variation from the average tends to be.³⁶⁰ Basal metabolic rate has been found to be one of the physiological constants, depending on height and weight.

MUSCULAR SYSTEM

Movements of the body are produced by muscular action. Muscles are formed of bundles of a special kind of cell which is able to shorten or elongate under nervous stimulation. Muscles under the control of the will, such as those of the arms and legs, are known as voluntary; others, such as those of the stomach, are known as involuntary. They differ in the character of the cells that compose them. Muscles cover most of the skeleton and are disposed in all directions, so that a great variety of motion is possible. In most instances muscles are in pairs, so that one counteracts the pull of another.*

The growth and maturation of this system continues throughout the developmental period. At birth the muscles represent 25 per cent of body weight. During the early years, up to four years of age, their growth is proportionate to the growth of the body as a whole. During the fifth year they begin to grow more rapidly. About 75 per cent of weight increase at this time can be attributed to muscles. Knowledge of the growth in certain muscle groups has been extended through the study of x-ray shadows.³⁵⁵ X-rays will also demonstrate the density of muscular tissue. Krogman says children with "light muscle shadows fatigue easily; they are

* For detailed study of the function and nature of the muscle see Gray's "Anatomy" (24th Ed.) and Starling's "Human Physiology" (8th Ed.).

prone likewise to mental fatigue, with overt symptoms of restlessness, impatience and irritability. . . .”* Maturation changes have been observed indirectly through tests which measure motor



Fig. 21.—This child at two years and four months has good muscle development.

ability and strength. In young children many of these tests cannot be utilized.

* Krogman²¹⁰ p. (283).

It is probable that no new muscle fibers are added after birth. Changes are due to increases in length, breadth, and thickness of the fibers; to their structure, to their attachment, and to their control through the nervous system. In the newborn the muscles of greatest development are found in the eye and in the respiratory tract. The arm muscles are better developed than those of the leg. During the course of development other muscle groups outstrip those best developed in the newborn, so that in adulthood the thickest bundles are found in the leg and in the back. In the early years the large muscles are better developed than the small, fine muscles. The young child is more skillful, therefore, in activities involving large movements than in activities involving precision. In the newborn the connective tissue is only moderately developed, and elastic fibers are absent. Both of these types of fiber increase in number with age; thus, as the child grows his muscle functions more adequately. The condition of the muscles at all ages depends upon the constitution of the child, his health, and his habits of eating, sleeping, and activity. In turn, one of the indicators of the health of a child is the degree of muscle tone, which is the condition of constant partial contraction. The tone of the muscles is important since it affords much of the support that various structures of the body require, such as the muscles of the abdomen give to the digestive organs when a person stands upright.

Posture.—Good posture, or good body balance, is necessary for the proper functioning of the body. It is necessary for good body mechanics, which is the use of the body which allows for the functioning of all the organs and systems effectively and without strain. It is generally accepted that efficient use of the body has a beneficial effect on the general health and physical well being of an individual, and equally accepted that poor body mechanics, with its accompanying lack of muscle tone, lowered threshold of fatigue and lessened available mechanical energy, has a bad effect on the general health. The body, like any other machine, can be mechanically efficient only when all its parts are maintained in equilibrium.

There are four important facts which must be taken into consideration when discussing the body mechanics of a young child. First, his body is subject to the laws of gravity, and therefore maintenance of good balance with the least muscular effort demands that the body must be as nearly as possible arranged symmetrically about a line that passes through the center of gravity.

As indicated in Figure 22, this line passes a little in front of the ankle, through the hip joint, the tip of the shoulder and the ear. Figure 22 also shows that when the body is out of balance some part is likely to be pushed or pulled out of its normal place or must work under a strain. Secondly, the condition of the muscles and bones influences balance. The muscles attached to the bones hold the body in position as well as make locomotion possible. Good muscle tone is, therefore, important. All the skeletal muscles

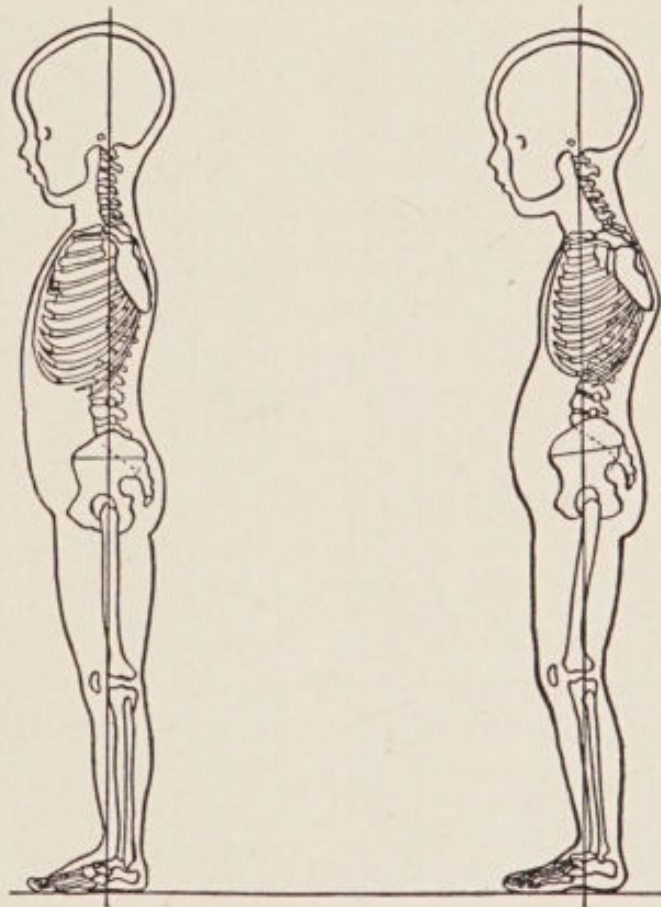


Fig. 22.—Good and poor posture. (“The Child from One to Six, His Care and Training.” Children’s Bureau Publication No. 30, U. S. Department of Labor, p. 31.)

are arranged in pairs, and in order to have good balance of parts of the body these opposing muscles must be of equal strength. When one of a pair of muscles is strong and the other weak, equilibrium is lost, and that part of the body is thrown out of balance. Forward shoulders illustrate this point. Thirdly, balance is influenced by the child’s stage of growth and development. A very young child is unstable when he stands because of a high center of gravity, a small base, and an immature nervous system which make him topheavy and unable to readjust his balance when it is

disturbed. We will see, as we discuss the changes in balance as the child develops, just how important it is to bear in mind this third fact. The fourth fact is that environment is a strong determiner of the habitual balance of the body.

The newborn brings with him the position acquired in the uterus. With legs and arms flexed and a convex curve which includes head and body, he is practically a little ball. Much of the first year he is in a recumbent position and the force of gravity operates horizontally; this tends toward "unrolling" the "coiling" which had been his uterine position. The activity of the infant also is a factor. When the neck muscles become mature enough he holds up his head and later sits up. His back is a long convex curve throughout the length of the spine. Some children, however, have a straight back when sitting. When the child begins to stand and walk the abdomen becomes prominent, and in proportion to the prominence of the abdomen a lumbar lordosis, or curve at the lower part of the back, develops. The line of his upper back and head, however, is straight. The legs have lost some of the natural curve which is often confused with the condition called bowlegs, which may be one of the characteristics of a rachitic child. During the period of early infancy when he kicks, stretches and stiffens his legs and feet when he cries or anticipates being taken up, he is learning how to shorten the external rotators of the thigh and exercise the muscles in the abdomen and buttocks. This stretching and adjustment of muscles in the hip, back, legs, shoulder, chest and abdomen is a part of his development in preparation for crawling and walking; he should be free to use his arms and legs and encouraged to do so within the limits of his strength, but certainly not to the point of fatigue.

To maintain his balance the child, when he begins to stand and walk, stands with everted (toeing out) feet far apart and with knees flexed. This adds stability by increasing the base on which he stands and lowers his center of gravity. The weight of the body tends to fall on the inner part of the foot and pronation occurs. Because of the relative strength of the various muscle groups of the leg, the pronation continues to increase until about three years of age. Children of this age have knock knees and the associated pronation. Gradually, as the rate of growth slows down and relative strength and coordination increase with increased activity, skillful movement becomes as important as weight-bearing in the child's balance. With the variety of activity and the resulting

muscle strength of the various muscle groups, feet toe straight ahead, knocked knees have become straight and pronation has greatly decreased by six years of age. During these years there has also been a gradual strengthening of the abdominal muscles and those of the buttocks, with the beginning of a lessening of the forward tilt of the pelvis.³⁵⁸

In the early years the beginning of poor posture as well as good posture may occur. Figure 23 shows a child with good posture;

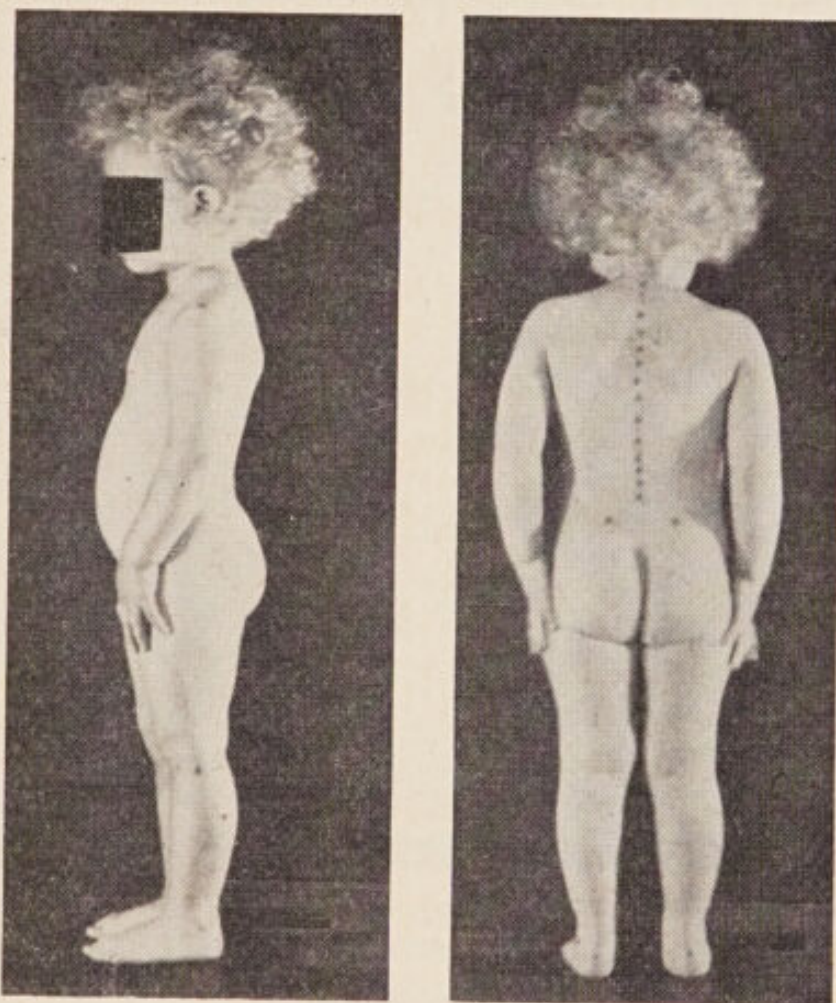
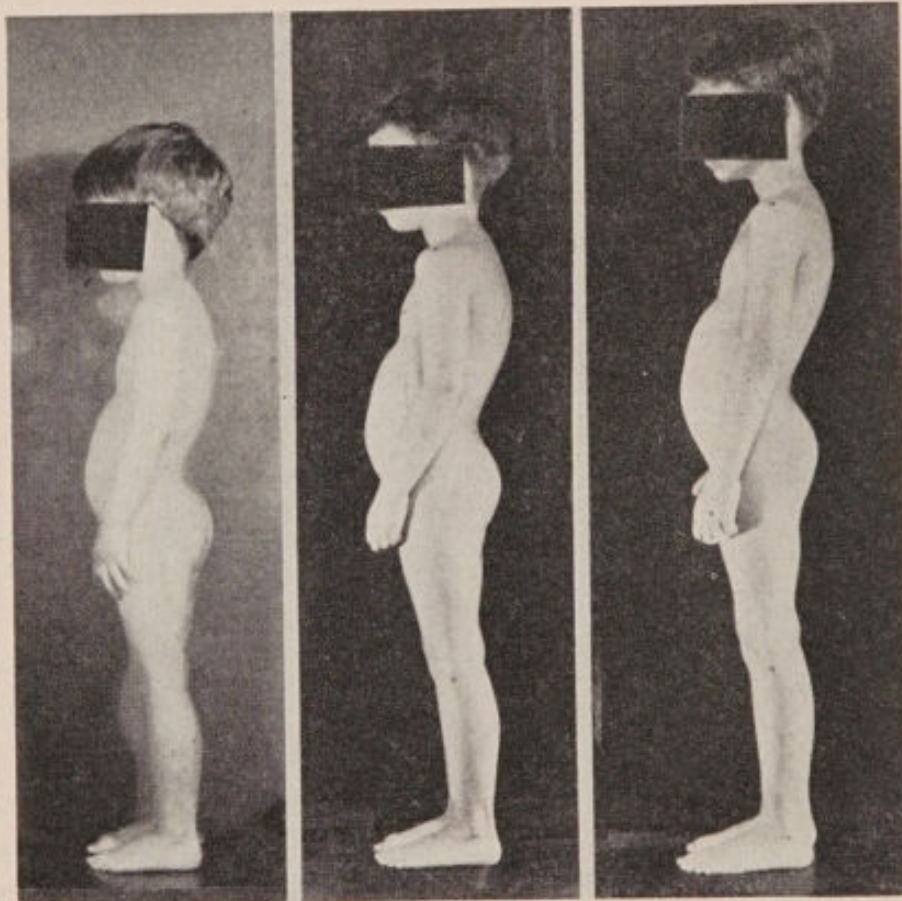


Fig. 23.—Good posture in a girl of nursery school age (two years, six months).

Figure 24 shows a child with poor posture. Note the muscular relaxation in the latter child.

Poor posture may be the result of an exaggeration of some phase of development. For example, pronation may be severe enough to require attention at an early age. Poor posture may also be due to some body asymmetry such as one leg being shorter than the other. Again, it may be due to lack of vigor which is the result of some organic disturbance. A regular check-up by a physician will catch the beginnings of any difficulty.

There are many factors contributing to posture, and all of them do so by their direct or indirect relationship to the condition of the muscles and bones. Good muscles cannot exist without good nutrition. Good nutrition implies not only an optimum diet, but also the absorption and utilization of the chemical substances in that food which go to make up the tissues of the body and provide for their function. It is necessary, therefore, to consider digestion,



Age: 3 years
1 month

Age: 4 years
9 months

Age: 5 years
10 months

Fig. 24.—Showing the same poor postural pattern of a child at different age levels. Note the sharp angle of pelvic tilt, prominent abdomen, lordosis, round back, flat chest, forward shoulders, and forward head.

elimination, the balance of rest and activity, and the emotional tone of the child. A poor balance of rest and activity with too little relaxation during the day and too little sleep at night will result ultimately in fatigue. Small children require shorter periods of activity than older children and need alternating periods of relaxation. Many infants are allowed to sit alone at too early an age and for too long a period until they are fatigued. It is difficult for the adult to remember that to sit erect for a little child is a serious

physical undertaking, and to stand alone is an incredibly complex and delicate mechanical achievement, throwing into new tensions every one of the complicated muscle-bone levers of his body. An emotionally disturbed child may easily reflect his unhappiness directly in his posture. In our experience we have seen preschool children who were insecure and unhappy indicate their unhappiness by the way they balanced their bodies both in repose and in activity. Generally, the young child enjoys all kinds of activity, running, climbing, digging, swinging, etc., but occasionally a child limits himself and is very hesitant to try new activities. Some muscles of such a child lack the stimulation of vigorous activity and do not develop as well as some others. They may lead to poor balance. A child with a focus of infection will lack vigor. A child with a defect, such as poor hearing or eyesight, may develop a characteristic posture.

Certain aspects of the child's surroundings may easily affect his posture. The clothing of young children today is generally loose and light, so that their activity is not impeded. However, outdoor clothing may be so heavy and cumbersome that it limits the possibilities of activity. Shoes and stockings need watching. Stockings may become too short after washing and thus cramp the toes. After shrinking the stockings should be $\frac{1}{2}$ to $\frac{3}{4}$ of an inch longer than the child's foot.^{370c} Shoes should fit the foot so as to give both support and flexibility. Laced shoes with combination last are recommended because of the relatively broad toe and narrow heel of the young child. Beds should be flat and firm. Chairs should be low enough for legs to touch the floor, shallow enough so that the child can sit with his back supported. When he sits in a chair too high and too deep the weight of his dangling feet pulls his shoulder girdle forward and thrusts his head forward.

The role of the parent or other adults in relation to posture is to provide the child with his needs for growth, to offer him a satisfactory environment, and to give him the freedom to explore that environment. In addition he needs protection against illness as far as possible, and when illness is inevitable, protection from fatigue as he is convalescing. The muscles of a child who has been sick have lost some of their tone. Time is needed for their recuperation.

It is said, habits of posture which become crystallized in later years may have begun back in the early years. Thus we see patterns of posture persisting through the years. However, this is

not inevitable. Children with relaxed musculature resulting in poor balance need not carry that posture throughout life. With a careful evaluation of the child, physically and emotionally as a basis, an adult can plan for that child so that all his individual needs will be met. When that is done and carried out he will be on his way to good body balance for him. Figure 25 shows improvement in muscle tone that resulted from adequate nutrition, a good balance of rest and activity of various kinds, and, in the pre-adolescent years, guidance in how to maintain good balance.

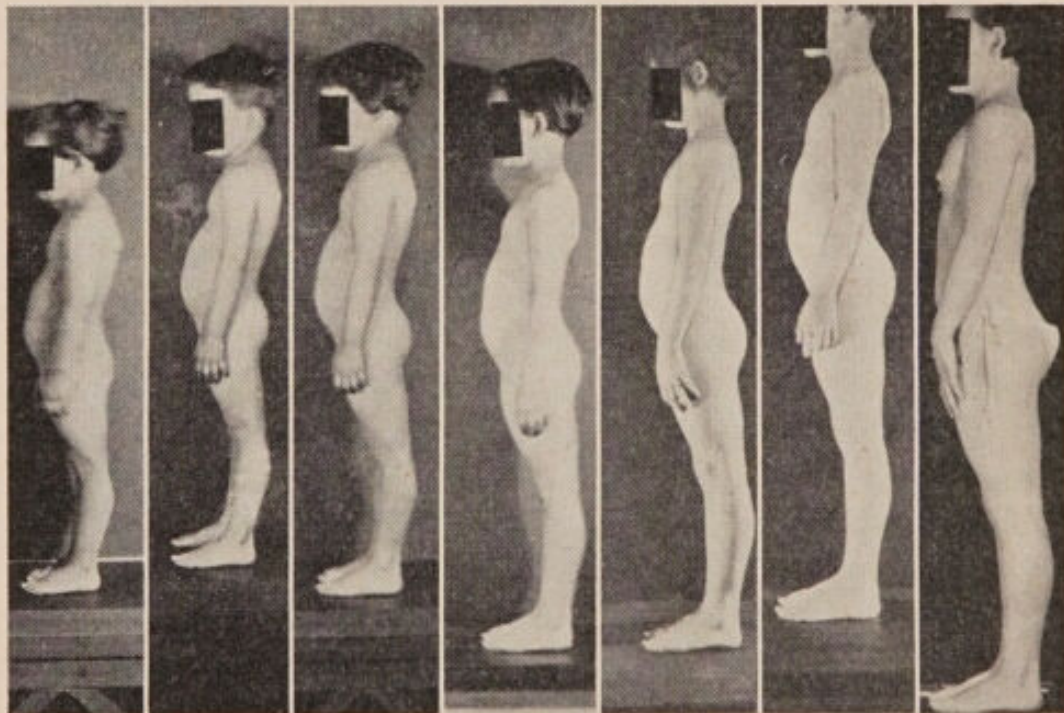


Fig. 25.—The posture of a girl from preschool age to preadolescence.

BODY TEMPERATURE

One of the first precautions taken when a baby is born is to prevent an undue loss of body heat by exposing the surface of his body to cold air or cold surroundings. In fact, for the first few months of his life care is taken to keep him warm and comfortable. The temperature of the child's body is maintained when the oxidative processes in the tissues liberate more energy as heat than the body loses by its contact with the surrounding air, by the evaporation of the perspiration, by warming the cool air taken into the lungs and by warming the cool liquids and foods taken into the stomach. Oxidation is constantly taking place in all the tissues of the body. However, the skeletal muscles, which constitute more than half the weight of the soft tissues, are responsible

for a considerable share in the function of maintaining body temperature, since 75 per cent of the energy used by the muscles is set free as heat. Movement of the child's body, then, has a significant relation to body temperature. Heat production can be increased by voluntary exercise or by increased food consumption, and heat loss can be modified by the amount and the kind of clothing worn or by wetting the surface of the body, as in bathing.

Since the loss of heat depends on the difference of temperature between the surface of the body and the surrounding air or immediate environment, it will be largely affected by the surface temperature and therefore by the amount of blood flowing through the skin. The blood flow is under the control of the central nervous system, and when the skin is cooled, it is by altering the size of the blood vessels in the skin that the central nervous system can act in regulating heat loss. Children do not maintain the same temperature every hour of the day and night; each individual has a curve of temperature characteristic of his body. This curve of temperature is slowly acquired after birth, is related to the child's routine and is fully established around two years, when the child is walking and very active.²⁰²

In infants and very young children the temperature of their bodies is usually taken through the rectum and the study of Bayley and Stolz on well, healthy children between one month and three years of age indicated that rectal temperatures tend to increase during the first seven months, remain constant until twenty-four months and then drop. A temperature below 99.0° F. they found to be rare between six months and twenty-one months; readings of 100° F. or slightly higher were comparatively frequent during these ages. Even at six years of age they found the average temperature taken by mouth to be 99.2° F.³³ To expect all children to have a constant temperature at the so-called normal, 98.6° F., is unreasonable. Even a temperature of 100° F. need not necessarily indicate an illness.

One child may have a consistent tendency toward a high temperature, another child may have a tendency toward a low temperature. One child may pass through this maturational change at an early age, another may be slower. One child may react more vigorously to his environment because of a less well-developed temperature-regulating mechanism, another child may be more stable because he has made greater progress in developing this stabilizing mechanism. All children acquire more stability as they

grow older. The instability in young children is intensified by a larger surface area and capillaries nearer the surface which permit considerable loss of heat in the early years. Temperature in a well child may vary because of changes in external temperatures, exercise, or emotional disturbances.

REPRODUCTIVE SYSTEM

The primary reproductive structures in the human body are, in the female, the ovaries, and in the male, the testes. They produce the reproductive units, the ova and the sperm cells. There are a number of accessory structures, especially in the female, which facilitate fertilization and provide more adequately for the development of the embryo. Other structures in the male sexual system serve accessory function in reproduction. During the latter part of fetal life the ovaries grow rapidly and their rapid growth continues in the early postnatal stages. Their average weight in the newborn is about 0.3 gm. which is doubled in the first six months and tripled by the end of the third year. Throughout childhood there is great variation in their weight and form. The two testes of the male with their coiled tubes in which the sperm is stored (the epididymides) double their birth weight in the first two years of life and after that they increase in weight very slowly. During the greater part of fetal life the testes are within the abdominal cavity and only reach their permanent scrotal position shortly before birth.

NERVOUS SYSTEM*

The nervous system, with its two parts, the central and peripheral, is the mechanism concerned with the correlation and integration of various bodily processes, the reactions and adjustments of the organism to its environment, and with conscious life.

The central nervous system consists of the brain and the spinal cord, which are continuous with one another. The peripheral nervous system consists of a series of nerves by which the central nervous system is connected with the various tissues of the body. For descriptive purposes these nerves may be arranged in two groups, the cerebrospinal and the autonomic; the two groups are intimately connected and closely intermingled. It is largely through the agency of the central nervous system that all the various tissues

* For detailed discussion of the nervous system see Gray's "Anatomy of the Human Body,"¹⁴¹ Starling's "Principles of Human Physiology,"¹¹¹ and Carlson and Johnson's "Machinery of the Body."⁶⁸

and systems of the body are integrated into a smoothly operating unit. The functional unit in the central nervous system is the reflex. "The growth of the mind is profoundly and inseparably bound up with the growth of the nervous system. Five months before the baby is born all of the nerve cells he will ever possess have already been formed and many of them are prepared to function in an orderly way. At this time the fetus makes vigorous movements of arms and legs; the eyelids can wink; the eyeballs can roll; the hands can clasp; the mouth can open and close; the throat can swallow; the chest makes rhythmic movements in preparation for the event of birth when the breath of postnatal life will rush into the lungs." *The growth of the nervous system, like all growth, is a patterning process. It produces patterned changes in the nerve cells, which in turn produce corresponding changes in patterns of behavior. In the young child it is these changes in patterns of behavior which give us an understanding of what changes are taking place in his nervous system. It is significant that by the sixth year the child's nervous system is well developed and adequately stocked with mature cells. This maturity has to do with his learning processes, his activity, the maturity of his habits and the functioning of his digestive system.

At birth the nervous system is very immature in its functioning, although the brain grows much more rapidly in fetal life and early infancy than the rest of the body. The brain at birth has reached 25 per cent of its mature size, while the body as a whole is only 5 per cent of its mature size. By two years the size of the brain is 55 per cent mature as compared to the body's 20 per cent maturity and by nine years it has reached 95 per cent of maturity.³⁵³ There are certain reflex activities essential to life which are well developed at birth, such as sucking, swallowing, emptying the bladder, coughing. There are a number of reflex activities, however, which are present at birth but are not fully developed and efficient. For example, if the sole of a very young infant is tickled, instead of withdrawing his foot he will wave his legs and arms, "screw up" his face, and make other movements unassociated with the point of stimulation. It is after some months that reflex activities become localized and efficient. (For more detailed discussion of development of reflexes see p. 253 f.) Voluntary control of body movements such as sitting, standing, control of bladder and bowel movements, and the like, involve learning and a later

* Gesell and Ilg¹³⁶ (p. 18).

stage of physical and mental maturity as well as further bone and muscle development. The ability to achieve these controls follows an orderly pattern of development as we shall see later, but the chronological age at which it is achieved varies among children.

The ability to register sensations is in most instances present at birth, but the impression made by the stimulus is much less acute at that time than it is in later life. This is discussed in some detail later under sensory development (p. 285 ff).

ORGANS OF SPECIAL SENSE

It is through the organs of special sense that the child becomes acquainted with the world in which he lives and learning for the normal child is largely dependent upon the efficiency of these organs. It is basic, therefore, if the learning processes are to be understood, to be familiar with the structure and functions of the organs through which his brain receives stimuli from the outside world.

The organs of special sense may be divided into (1) those of the special senses of taste, smell, sight and hearing, and (2) those associated with the general sensation of heat, cold, pain, pressure, etc. What we commonly think of as sense organs are those which have receptors that are stimulated by or directly acted upon by some energy change. The sense of touch can only be stimulated if the source of the energy comes into actual contact with the surface of the body or at least only a short distance from it. The receptors of the eye and ear, on the other hand, can be affected by energy having its source at a distance. Their receptors are called distance receptors. For example, the light emitted by the stars can be seen although the source of the light is millions of miles away. Light waves, though they come from great distances, must impinge upon the retina of the eye to stimulate it.

So far as we know the infant cannot distinguish among the distances from his body of objects that he can touch or see or smell. By individual learning he can acquire the ability to judge the source of the stimulus. Experience will teach him that to touch an object it must be near him; the sun he sees may be far away; the flower he smells may be a few yards away. It is through the receptors, especially the distance receptors, the child gains a more accurate picture of the world outside himself than would otherwise be possible. The development of sensory awareness and sense judgment will be discussed later (p. 290 ff).

Sense of Sight.—To appreciate the discussion of the development of the perception of size, shape, and distance in children, it is important to know about the physical equipment with which the child is endowed to make perception possible. Through the sense of vision the child detects light, senses form, recognizes color, and perceives depth and distance in space.

The eye, as an organ, is equipped in its internal structure with the retina, which has specialized kinds of sensory cells called rods and cones. Although the retina is not structurally complete until the child is about sixteen weeks old, the rods which detect the intensity of light and make vision possible function immediately after birth. The cone cells insure the recognition of color and also contribute to the recognition of form. Certain color discrimination is possible as early as the third or fourth month, for by this age the cones may be developed. However, accurate perception of both color and form comes at a later stage of development, since the cones are dependent on learning. The accurate perception of distance and depth is made possible by focusing of both eyes upon the object at the same time, and these two objects are perceived in consciousness as one. The ability to fuse two images into one is known as binocular vision, and is an important aid in judging distance. This is an acquired ability dependent both upon coordinated eye-muscle activity and upon learning, and is acquired slowly and is achieved by most children at the age of six or eight years. These facts will be considered in connection with the discussion of perception of size, shape and distance (p. 295 ff).

Sense of Hearing.—The auditory apparatus consists of the ears, two auditory nerves to carry sensations of sound to the brain and centers of hearing in the brain. The ear is divided into three portions: the outer, middle and inner ear. The outer and middle ear are conducting mechanisms which convey the sound waves to the cochlea of the inner ear wherein is contained the sound receptors. Sound waves which enter the external auditory canal, setting the ear drum in vibration, are transmitted across the cavity of the middle ear by three little ear bones; the latter bridge the space from the ear drum to the membrane which separates the middle ear from the inner ear. Within the inner ear are two mechanisms anatomically in close relation but physiologically quite separate: the cochlea and the vestibule. The cochlea belongs to the auditory organ: the vestibule, a series of organs, is concerned with equilibrium and has no connection with hearing.

The cavity of the middle ear has almost reached its final size at birth, in fact, the bones of the middle ear have reached their mature size in the middle of fetal life. The tympanic membrane has practically completed its growth by the time of birth. The bony labyrinth of the inner ear has attained its adult size and proportion at the time of birth. Hearing in the newborn is probably established in a few days as we shall see later (p. 288). In the infant the eustachian tube, the channel connecting the middle ear with the throat, is short, straight, and comparatively wide. This may account for the greater incidence of middle ear infections in infancy, bacteria from the throat having easy access to the ear.

Senses of Taste and Smell.—The sense organs of taste and smell are normally stimulated directly by chemicals in solution and are called chemoreceptors. The chemicals initiate the nerve impulse in the nerve fibers responsible for taste and smell. The chemicals must be in solution in saliva or the secretions of the nasal cavity. A perfectly dry tongue does not taste and the dry nasal cavity can not be stimulated by aromatic substances. They have very low thresholds and can be stimulated by solutions of great dilution (one part in two million).

Taste.—The receptor structures for taste, known as taste buds, are distributed chiefly to the tongue, but also to the pharynx, roof of the mouth, and the larynx. Taste of salt and of sweet predominate at the tip of the tongue, bitter is located at the base of the tongue posteriorly, and acid along the borders. Taste buds are present at birth and seem to be fairly well developed, and newborn infants are able to differentiate between pleasant and unpleasant sensations. The taste buds increase considerably in number during the first year as we shall see later (p. 287).

Smell.—In each nasal cavity there are small areas of ciliated cells known as olfactory epithelium. Each is bathed in liquid, and stimulation depends on the solubility of the substance to be detected in this liquid. The moist receptors lie in the upper portion of the nasal cavity so that in ordinary respiration the stream of air does not come in contact with them.

No satisfactory classification of smells has been made. It is recognized that the olfactory sense is easily fatigued, and that even if it is fatigued so as to be insensitive for one kind of smell it is still normally excitable for other smells. Our knowledge of the sense of smell is still incomplete and unsatisfactory at the present time.

GLANDS OF INTERNAL SECRETION

It has been demonstrated that growth is greatly influenced by the glands of internal secretion. In various parts of the body there are small glands that secrete and pour into the blood and lymph complicated chemical substances which are essential to life and to the growth and health of the body. These glands vary widely in their structure and in the nature of their secretions and have the special functions of initiating, regulating and controlling some of the activities of organs and tissues. Even before a child is born, if his thyroid gland is not functioning properly, he may be born in the abnormal condition known as cretinism. After the child is born his own glands must supply all his growth needs, changing as they do from time to time. The glands also influence the rate of growth and development of different parts of the body. For example, a deficiency of the secretion of the anterior lobe of the pituitary gland may cause dwarfism and an excess of the same secretion may cause giantism. Some of the secretions of the gland of internal secretion have been isolated and their chemical composition studied and even made synthetically. Thyroxin from the thyroid, adrenin from the adrenals and insulin from the pancreas are examples of these secretions. Other secretions have not been isolated and are known only by their effect on the body and are used in the form of "organic extracts." Although the amount of the secretions of these glands may be almost inconceivably small, they have incredible potency. So intricate is the relationship between the glands of internal secretion that it is impossible entirely to separate their specific action since they affect each other as well as the various organs of the body. The efficiency of their functioning has, therefore, largely to be judged by the physical condition or the growth of the child.

Thyroid Gland.—The thyroid gland is probably the best known of the endocrine glands because of the pathological effects it produces when its functioning is abnormal, i.e., either overactive or underactive. The thyroid gland is located in the front of the neck and consists of a narrow center joined on either side by large lobes. Its development begins early in fetal life and it probably becomes functional long before birth. After birth it continues to grow in size until puberty. Its principal secretion is the hormone known as thyroxin. Entering the blood stream its chief action is to aid in regulating the metabolic processes of the body. Underactivity of the gland lowers the activity of the body tissues, and, if the condi-

tion is present from birth, both mental and physical growth are retarded, and the child is known as a cretin. However, if the thyroid extract is given very early to such a child and in the proper amounts, the effects of this deficiency may be partly overcome and the physical and mental growth may proceed fairly normally.

In overactivity of the thyroid secretion is excessive; this condition is accompanied by a rapid pulse, restlessness, nervous irritability and tremor of the hands, increased perspiration and loss of weight. Often when these symptoms appear the gland is enlarged

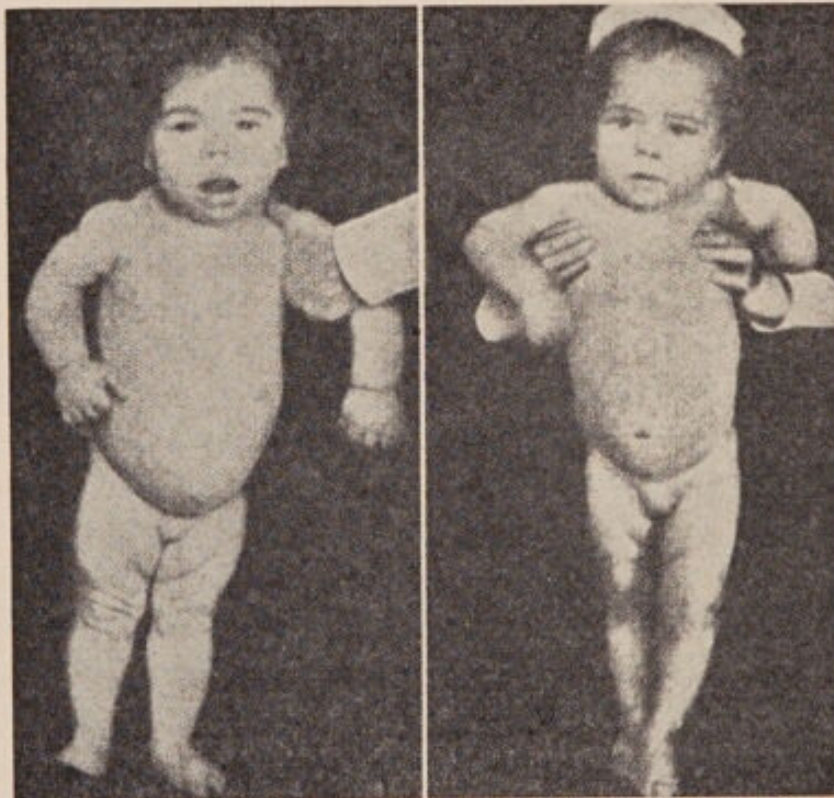


Fig. 26.—A cretin, or a child with a deficient thyroid gland, before and after treatment with thyroid gland. (From Sharpey-Schafer after Bramwell, Longmans, Green and Co.).

causing a swelling or goiter in the neck. Iodine has come to be recognized as essential for the normal activity of the thyroid gland. Determination of basal metabolism rate is one of the methods used in diagnosing the presence of an excess or a deficiency of this secretion.

Parathyroid Glands.—These are four tiny glands, each about the size of a grain of wheat and together weighing about 2 gm. They lie on the posterior surface of the thyroid gland, are enclosed in fibrous capsules and are richly supplied with capillaries into which their secretion is poured. They attain their maximum

growth and their mature structure at puberty. Their secretion is essential to the regulation of calcium metabolism and by their regulatory effect on blood calcium, they help maintain proper irritability of the muscle tissue. Their function is especially important during the preschool years since at that period bone tissue is being rapidly laid down.

In animal experiments if the parathyroids are injured or destroyed, the bones soften, the hair drops out, the animal becomes excessively nervous, develops tetanic convulsions, cannot sleep and dies.

Adrenal Glands.—The adrenal glands are two flattened, yellowish bodies lying in front of the upper end of each kidney. They are very small, their average weight being from 3.5 to 5 gm. each.

Each gland consists of an external cortical portion and an internal medullary portion. The cortex seems to develop first, and is recognized at about the fourth week of intra-uterine life.

The adrenal medulla gives off an internal secretion, adrenin. Its functions consist, in part, of constriction of arterioles, acceleration of heart rate, constriction of the radial muscle of the iris of the eye. Its synthetic form, epinephrine, injected as a drug (stimulant), has some of the same effects for an hour or two.

The cortex produces hormones essential to the maintenance of life itself. New effects of its products are being discovered constantly. It is of physiological importance, particularly in carbohydrate metabolism and muscular efficiency.

Growth of the adrenals continues until around puberty.

Pituitary Gland.—The pituitary gland, or hypophysis, is a small gland about the size of a pea lying in a depression of bone called the sella turcica (Turkish saddle) in one of the most protected parts of the head. It is a gland consisting of two parts, the glandular anterior portion and the posterior neural portion. At maturity it weighs 0.5 to 0.7 gm. The anterior lobe elaborates hormones which profoundly affect almost every organ in the body. This is done either directly or indirectly through its influence on the activity of other glands. One hormone influences the growth of bone and connective tissue. If there is an excess of this hormone in the growing years the individual may grow excessively in stature. If the excess comes after the growing years (about twenty-five years), the bones do not become longer but coarser and heavier. If there is a deficiency of this hormone during the growing period, infantile characteristics persist.

The relation of the growth-stimulating hormone to the gonads is very complex and varies at different periods in the child's life. The anterior pituitary secretes another hormone which stimulates the development of the gonads. It is not definitely known at what age this hormone assumes an important role in the child's development, but probably in the period discussed in this text.

It is now known that the posterior neural portion regulates water metabolism, causes contraction of all involuntary muscles, and raises blood pressure. An extract of the posterior pituitary is sometimes used during delivery to stimulate contractions of the uterus.

It is said, "The pituitary gland acts as a presiding genius over the thyroid, adrenals and sex glands and over growth, development and metabolic control."*

The Thymus Gland.—The thymus gland is found a little below the lower border of the thyroid gland, lying partly in the neck and partly in the thorax behind the sternum. In structure it consists of small nodules or follicles somewhat fused together. Each follicle consists of a medullary and a cortical portion. The cortical part consists of lymphoid cells, while in the medullary part peculiar nest-like bodies are found and fewer lymphoid cells. The thymus, therefore, is essentially a lymphoid organ.† It attains its maximum growth during childhood. After puberty it gradually dwindles in size. The beginning of its involution occurs at different ages for the different parts of the thymus. The lymphoid tissue begins at four years; medulla begins at puberty; the connective tissue and fat continue to increase until old age.⁴⁶

The Pineal Body.—The pineal body is a small conical structure which is attached to the roof of the third ventricle of the brain. In man it represents the rudiments of a photosensitive organ, the "third" eye, present in certain reptiles and other lower vertebrates.

In early life its glandular structure reaches its greatest development at about the seventh year. Tumors of the pineal body have been found to be *associated* with hypergenitalism and sexual precocity in boys. Aside from this possible relationship, there is no clinical or experimental evidence to date which indicates that the pineal body is an endocrine gland.

* Stuart³⁵³ (p. 108).

† There is considerable confusion as to the function of the thymus and further investigation is needed before its functions can be definitely stated.

Sex Glands.—The testes and ovaries are part of the reproductive system and also produce internal secretions which lead us to include them among glands of internal secretion. The testes not only produce sperm cells, but also hormones called androgens that are responsible for bringing about many of the physiological and psychological changes incident to maturity. Failure of the testes to produce this secretion at puberty causes a continuation of growth typical of childhood, thus producing overgrowth with an accompanying failure of sex development.

The ovaries produce ova and internal secretions containing the hormones, *estrogens* and *progestin*.

The ovaries and testes remain relatively quiescent during early childhood. It is not definitely known when the secretions of the male hormones begin—probably not until middle childhood. One type of the ovarian hormones, the estrogens, are secreted in the early years, but only in small amounts. The estrogens act as a general stimulant to sex differentiation and bring on in animals the condition of estrus (similar to menstruation in women). Progestin adds a secondary stimulation that prepares the uterus for the reception of the fertilized ovum and regulates various processes of pregnancy. If the sex glands fail to produce these hormones, there is a delay in sex development and the infantile characteristics continue. If there is an excessive secretion in early childhood, it produces precocious puberty.

The sex glands are related functionally to all the other glands of internal secretion, and are influenced in turn by the activity of these glands.

THE LYMPHATIC SYSTEM

When a physician is examining a young child, he feels the glands in his neck, under his arms and in other parts of the body. It is in these areas that the lymph glands come close to the surface of the body and if they are enlarged the condition can be felt. Lymph is important to the body in many ways, one of the most important being its contribution to the blood stream of lymphocytes, one of the types of white blood corpuscles. The fact that the lymphatic system increases relatively rapidly in infancy and childhood, that the lymphoid tissue is very abundant at birth, that the lymph ducts are more numerous and the lymph glands are larger and more prominent in childhood than in later life would seem to indicate the importance of the lymphatic system to normal development.³¹²

The lymphatic system consists of: (1) complex capillary networks which collect the lymph in the various organs and tissues; (2) of an elaborate system of collecting vessels which conduct the lymph from the capillaries to the large veins of the neck, where the lymph is poured into the blood stream; (3) lymph glands or nodes which are interspaced in the pathways of the collecting vessels filtering the lymph as it passes through them and contributing lymphocytes to it. Lymph, in general, originates as tissue fluid—the fluid which surrounds all cells. This, in turn, has reached the cells from the capillaries of the blood-circulation system. The composition of lymph resembles that of blood. It consists of the constituents of blood which are able to penetrate the capillary walls, plus elements added to it by the tissues. It has no red blood cells and has much less protein than blood plasma; otherwise it closely resembles blood plasma in composition.

THE CUTANEOUS SYSTEM

The cutaneous system consists of the skin and its appendages or accessory parts: the nails, hair, sweat glands and sebaceous or oil glands. The skin has important functions to perform for the child's body: the protection of the underlying parts from injury and from invasion by foreign organisms, also protection from drying; serves as a sense organ in that it is richly supplied with sensory nerves; plays an important part in the regulation of body temperature, since the loss of heat from the body must occur almost entirely through its surface. It also has limited excretory and absorbing powers. There is a continuous output of carbon dioxide through the skin, but the amount leaving the body in this way is negligible compared with that which is exhaled through the lungs. The skin reflects the general well-being of the body, and in children its texture and color are important to observe.

Nearly every part of the surface of the body except the palms of the hands and the soles of the feet are beset with hair follicles. The cuticle layer of the skin is kept supple and preserved from the drying effect of the atmosphere by being constantly impregnated with a fatty material known as sebum. This substance is secreted by the sebaceous or oil glands which are distributed all over the surface of the body wherever hair follicles are found, the mouth of the gland opening into the hair follicle. The secretion of sebum begins when the child is about a month old and is a continuous process.

The skin's subcutaneous tissue has the capacity to store various materials either provisionally or permanently. Of these the best known is fat which is laid down in fat cells. "The other type of storage which takes place in the skin is what Cannon calls storage by inundation, which may be compared with storage of water in a bog. When the blood is flooded with soluble substances, these may likewise find temporary storage, accompanied by water or not, in the subcutaneous tissues. The most noteworthy instances are of glucose and salts." *The amount of subcutaneous fat present under the skin of babies and the firmness of the flesh vary very widely.

The Hair.—The hair of the newborn changes in texture and sometimes in color as the child grows. The hair present on the head and body of the newborn falls out in the first few months and is slowly replaced by that of a firmer texture. The amount of hair present at birth may vary widely, some babies have almost none, some have a heavy growth. As the child grows his hair varies much in length, thickness, and color in different parts of the body and in different races of mankind. There is no doubt growth and distribution of hair follicles are affected by hormones and vitamins, but exact knowledge of the effect is not yet available. The thyroid hormone is essential to the proper growth and normality of the hair. Hair does not grow indefinitely, but after a period of growth the length remains stationary and sooner or later may fall out, and a fresh cycle begin. Each hair follicle has its own characteristic growth rate and cycle. The hair, like the skin, reflects the health of the child, and when healthy has a gloss, is smooth and elastic. In our observation of young children, the unhealthy condition of the hair is one of the early indications of disturbed body metabolism.

The Sweat Glands.—The sweat glands are fully formed at birth, are distributed over almost the whole surface of the skin, begin to function when the child is one month old and serve a minor role in excretion. Their chief function is the secretion of sweat, which when evaporated cools the surface of the body. The most plentiful constituent of sweat is sodium chloride; urea is also present in about the same amount as in blood, and lactates seem to be either concentrated in or formed by the sweat glands. The secretion is under the control of the central nervous system, and except for the palms of the hands and soles of the feet has been shown to be

* Evans¹¹¹ (p. 1078).

almost entirely adapted to the regulation of the body temperature.

Sense of Touch, of Pain, of Temperature.—"We can distinguish several qualities of sensation among those having their origin in the skin, the sense of touch, including that of discrimination, the sense of pain and the sense of temperature. The very different qualities of the sensations suggest a special mechanism for each sense, and experimentation proves this to be correct."* "Isolated stimulation of small areas on the skin does not excite all the sensations but only a sense of touch, of pain, and of warmth or cold."†

By means of the sense of touch the child arrives at a conclusion as to shape, texture, hardness, and similar characteristics of bodies with which the skin comes into contact. This is important in the learning process (p. 286). Certain areas are more sensitive to stimulation than other areas; for example, the fingertips are more sensitive to touch than the back of the hand; the lips are more sensitive to heat than the hands. All areas of the skin are not sensitive to all kinds of stimuli; an object warmer than the temperature of the skin will stimulate only heat spots; a moderately cold object activates only cold spots. Each of the senses undoubtedly has its own special receptor structure which is adapted to respond to the definite kind of environmental change with which it is associated. These structures possess the same degree of specificity in their relation to the effective stimulating agent as do the rods or cones for light.⁶⁸

PROBLEMS FOR CLASS DISCUSSION

1. Three boys of the same age are in the kindergarten: one is below the average height and weight for his age, one is average, and the third is above average height and weight for his age. What can the teacher tell them about their own growth that will explain their differences, and how can she motivate their interest in their development?

2. Babies, three months old, six months old, one year old, and eighteen months, are brought to the discussion period of the class by their mothers. The class can question the mothers regarding the feeding of the children at the various age levels, also about their history and their training. These could be listed on the board and discussed with mothers. The class can observe the activity of which the children of different ages are capable, their body balance, their sensory development, their attitude toward strangers. The class can discuss how nearly they measure up to their conception of a well-developed child. Certain members can be asked to consider each of the systems how far they think these children have progressed toward the maturity that can be expected at their age.

* Gray¹⁴¹ (p. 1082).

† Evans¹¹¹ (p. 493).

3. The class can be given x-rays of the hands and feet of children under five years. Let them compare the differences at the various age levels. The class can discuss what a parent might be told about the bones of her child from a study of the x-rays of that child.

4. Begin the construction of a developmental chart, which, when you are finished, will summarize your growth material for you. On the left hand side set up categories for physical growth; for motor controls; for sense perceptions and judgments; for language; for memory, imagination and reasoning; for social development; and for emotional control and expression. Across the top set up age categories for birth, for one year, for three years, and for five years. In the column headed "Physical Growth" summarize the average growth standards for birth, one year, three years, and five years. Preserve this chart and, as you obtain materials in later chapters, fill in the other columns. Thus you will have a developmental chart which will show you a summary of various developmental stages for each of the four age levels listed. Reading down the birth column you can then summarize a developmental picture of a newborn baby; down the one-year column you will have a summary of the year-old child; down the three-year column the summary of a three-year-old, and down the five-year column of the five-year-old child.

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*The Child's Physical Equipment for Growth and
Development*

(CONTINUED)

BLOOD VASCULAR SYSTEM

The blood vascular system consists of the heart, the arteries, the veins, the capillaries and the blood. The functions of the blood vascular system are: to transport to the remotest parts of the body food, oxygen, hormones, disease-resisting substances; to collect wastes, liquids and gases; to preserve the conditions essential for normal cell activity. It is also involved in preservation of life through its coagulation mechanism and in maintaining the acid-base balance of the body.

Before birth very little blood flows through the lungs, since there is no oxygen in them, but the blood in both sides of the heart flows through the general circulation and out through the umbilical cord to the placenta. This is made possible by an opening between the right and left sides of the fetal heart. In the placenta the fetal blood is aerated. When the umbilical cord is cut this circulation must cease; the blood is forced into the lungs where oxygen can be obtained as soon as respiration is established. After pulmonary circulation is well established the opening between the sides of the heart closes. The fetal heart rate during the last five lunar months of pregnancy has been studied by Sontag and his associates and found to be 160 or more beats per minute in the normal fetuses included in the study.

At birth and throughout infancy the blood pressure is low, and the pulse weak. However, they both increase gradually as the child grows older. At birth the heart in proportion to body weight is slightly larger. It doubles its weight in two years and trebles it by four years. From birth to four years is its period of most rapid growth. Changes in structure are also taking place which are reflected in the functional changes. The heart rate during rest de-

creases from between 100 and 160 beats per minute at birth to 90 to 125 at the end of the second year, and to approximately 85 to 105 at five years. The adult rate is approximately 70 per minute.

The red cell count drops from between 5,000,000 to 7,000,000 per cu. mm. at birth to 3,000,000 to 4,500,000 at six to ten weeks. A rise follows so that at six months the count is 4,000,000 to 5,000,000; this remains constant throughout the rest of infancy and preschool years. The hemoglobin changes from a range of 17 to 25 gm. per 100 cc. blood at birth to 11 to 15 gm. at six to ten weeks, to 12 to 16 gm. at six months and continues the same throughout infancy. During the preschool years the hemoglobin is 13 to 15.5 gm. per 100 cc.³⁸⁴

The white count is quite variable in infancy. The same child will show fluctuations from day to day. These fluctuations decrease during the second year. At birth the count is 15,000 to 30,000 cells per cu. mm. It soon settles down to 5,000 to 20,000 and during the preschool years 6,000 to 15,000 (adult value is 6,000 to 10,000).

THE TEMPORARY TEETH

Teeth begin to form in the seventh week of fetal life and by the time a child is born all twenty of the temporary teeth and the first permanent teeth (six-year molars) are developing. Their development is influenced by heredity, prenatal conditions, nutrition, illness and certain endocrines.

The teeth are essential for the mastication of food and its preparation for swallowing and for digestion. The order of appearance of teeth in the mouth seems to fit in with the order in which the child's body displays an increasing ability to use more complex foods, although the analogy is not too close. The infant through the first six to eight months is taking liquid or semisolid foods that require no mastication. When he begins to eat chopped foods he needs teeth to cut and grind his food; upper and lower, central and lateral incisors (eight teeth) are normally present in the mouth by this age. When the child is between one and one-half and two years he is taking more solid food such as toast, vegetables, raw apples, which demand vigorous chewing before swallowing, and he has sixteen teeth including his first molars which insure mastication of the food he is eating. Between two and three years he has twenty teeth, his second molars having erupted, and is provided with adequate dentures now to eat adult food which is served to

him at this age. This marks maturity for the eruption of his temporary teeth.

The tooth has a central canal containing nerve fibers and blood vessels which bring nourishment to it. The canal is enclosed in dentine which forms the largest part of the tooth. Dentine is covered in the exposed part with enamel. The enamel is fully formed before the tooth erupts; the denture continues to form until the roots are completed, sometime after the tooth has erupted. The enamel and the dentine of the crowns of the temporary teeth begin to form in about the sixteenth week of fetal life, and of the first permanent molars shortly before birth.

The completion of the crowns and roots of the teeth takes place during these early years so that between three and four years of age the deciduous teeth have reached maturity. The formation of the crown of these teeth requires seven to fourteen months; while the time required for the same process in permanent teeth takes three to six years. The growth of the roots requires one and one-half to two and one-half years for the deciduous teeth and five to seven years for the permanent teeth.

The development of the permanent teeth continues throughout these early years so that by five years of age the crowns of the six-year molars and the incisors* have been completed. Table 4 gives the expected ages for the completion of the enamel, completion of the roots and the eruption of the teeth.

Deviations in the Order of Appearance of Temporary Teeth.—There are deviations in the order of appearance of teeth among children similar to the deviations that occur in epiphyseal appearance. There is also variation in the age at which teeth erupt in different children. While most children have their first tooth before eight months, some may have none until they are a year old. Again we see differences in the rate of maturity in children. Some are fast and some are slow in moving along the path of maturity. For some even the path may differ for we see again in tooth development, of which eruption is a part, that there is more than one road to maturity. The general pattern is the same but minor deviations do occur. The order is generally lower central incisor as the first tooth, followed by the upper central incisor; then the lateral incisors, the first molars, the cuspids and, last, the second molars. The teeth tend to erupt in pairs with periods of quiescence be-

* Data on crown and root formation taken from Schour and Massler³¹⁶.

TABLE 4.—ENAMEL FORMATION AND ERUPTION OF DECIDUOUS TEETH*

	First Enamel Formation Month (<i>Prenatal</i>)	Enamel Completed Month	Eruption Month	Root Completed Year
Upper teeth				
Central incisor.....	4	1½	7½	1½
Lateral incisor.....	4½	2½	9	2
Cuspid.....	5	9	18	3¼
First molar.....	5	6	14	2½
Second molar.....	6	11	24	3
Lower teeth				
Central incisor.....	4½	2½	6	1½
Lateral incisor.....	4½	3	7	1½
Cuspid.....	5	9	16	3¼
First molar.....	5	5½	12	2½
Second molar.....	6	10	20	3

* From Drenckhahn, V. C., and Taylor, C. R.: *Your Child's Teeth*. Chicago, American Dental Association, 1940, p. 36.

tween. One study indicated that a change in order most frequently was caused by variability in the eruption of the lateral incisors.³⁰⁷

Studies have indicated that there is no significant difference between boys and girls although boys are slightly ahead of girls in their first dentition; that size as measured by weight, height or facial measurements has no relation to time of eruption.³¹⁰ Since siblings often show a resemblance in their dentition it is possible that heredity may affect the eruption pattern. There is need for further investigation of the factors influencing the age at which teeth erupt.

Occlusion.—The development of occlusion (the fitting of the upper and lower teeth so that food may be chewed) of the temporary teeth continues for the first three years. By that time the pattern of the face is established. Following changes in the face are not characterized by marked changes in proportion but rather in a more or less proportionate increase in size.^{55a}



Fig. 27.—Impressions of the teeth of a preschool child showing malocclusion.

In the young child there is a period of a more rapid increase in the growth of the jaw which generally occurs about the time of the eruption of the deciduous teeth. If the growth of the dental arches is inadequate, the teeth may force themselves into too small a space resulting in crowding or irregular alignment. If, on the other hand, the growth of jaws is greater than necessary, spaces will appear between the teeth. If it is a matter of the growth of the jaw not being synchronized with the eruption of the teeth, the condition is only temporary.

One jaw may grow more rapidly than the other so that the teeth of the two jaws do not fit together properly; such a condition we designate as "malocclusion."* The lower jaw may grow slowly in width while the upper jaw grows normally; as a result the lower back teeth, or grinders, will fit inside the upper back teeth instead

* During the early years there is a comparatively small incidence of malocclusion. Later, during the school years, it becomes more of a problem.

of meeting them squarely, and the lower front incisors, or biting teeth, will be crowded (because of smaller arch) and will not fit behind the upper front incisors as is normal. Such malocclusion interferes with the chewing of food and becomes serious. Figure 27 shows the effect of malocclusion in the young child.

Irregularities in the development of the teeth and dental arches may be either of the type that corrects itself during development or it may be within the range of normal variation; however, if it is allowed to become a permanent condition it may become steadily worse. The growth and development of the teeth and jaws should be watched carefully; the child should be examined by

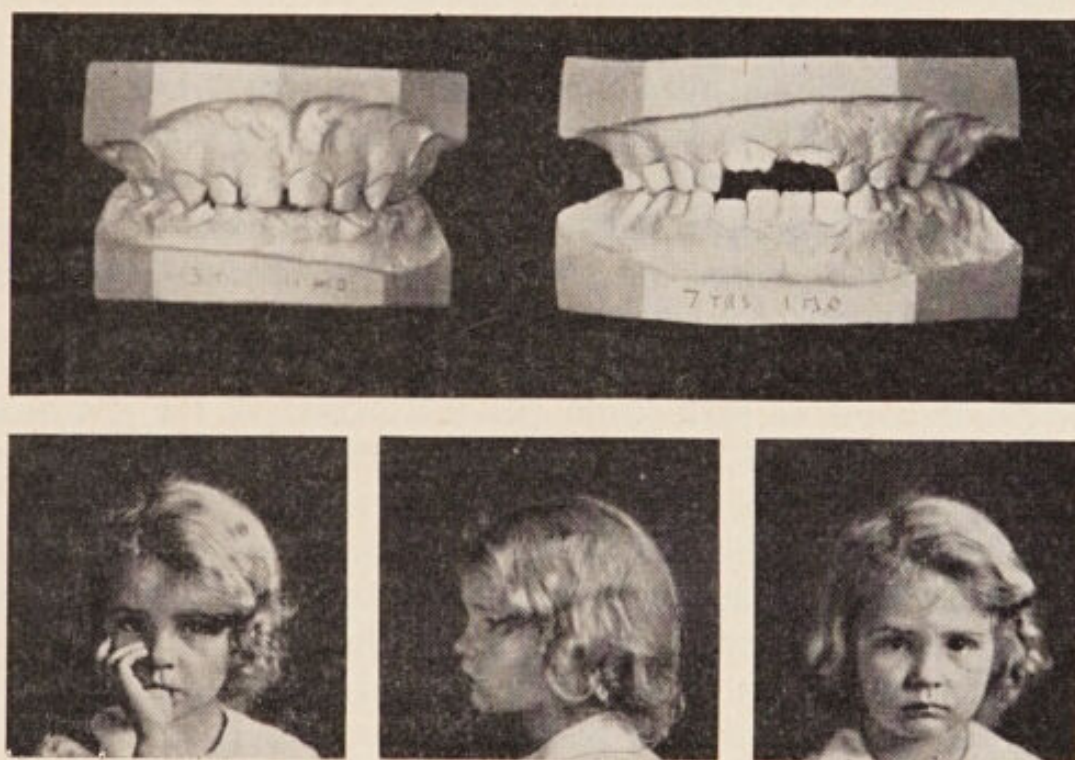


Fig. 28.—The effect of thumbsucking on the teeth.

a dentist trained in corrective work (orthodontist), growth appraisals made, a history kept and changes noted and interpreted by the orthodontist. It is considered a good practice to watch the development of the jaws beginning when the child is about three years of age. The orthodontist has intimate knowledge of the growth of the jaws, the face, the teeth and knowledge of the proper methods used in making these appraisals of growth and development. The orthodontist is in a position to decide when correction is necessary.

Thumbsucking is *one* of the causes of protrusion of the upper front teeth. Lewis and Lehman found that, if the habit of thumb-

sucking has not been broken, the teeth do not properly occlude and chewing is interfered with.²²¹ Figure 28 shows the effect of thumbsucking on tooth alignment and bite. If the habit is broken before the child is five, the child's teeth tend to resume their proper position so that "the bite" is normal. The self-correction of malocclusion has been observed in children when the habit has been broken as late as the tenth or eleventh year. However, this favorable result is not seen so commonly as in younger children. Whether or not self-correction is possible undoubtedly depends upon the degree of maturation of the tissues. The limiting age in terms of chronological age for an individual would depend upon his stage of development.

The premature loss of teeth, either through accident or decay, may affect the alignment of the permanent teeth. Lewis²²⁰ has found that this may or may not be true depending upon the stage of development of the jaw at the time of the loss. Since such premature loss may prove a hazard to good alignment of the permanent teeth, the care and preservation of the deciduous teeth are important.

Exercise of the jaws and teeth in chewing develops the jaw muscles, and this in turn stimulates the growth of the jaw bones and the circulation of blood in the gums. These factors contribute to the presence of "healthier" teeth.

The early introduction of foods such as toast or zwieback, which exercise the jaws and teeth, is, therefore, important. It is necessary to teach the young child to chew. This should be done at an early age, and it should be remembered that this is a process which is learned by the child and is not instinctive. The mistake is often made of giving sieved and mashed food for too long a period after the child's teeth have erupted, when he should be taught to chew. Teaching the child to chew requires patience and close supervision on the part of the parents, and allowing food to be swallowed in large unmasticated pieces is undersirable.

MATURATION OF THE NUTRITURE* AND ITS INDICATORS

During fetal life the food supply to which the child has access is elemental, such as calcium, iron, phosphorus, protein—not peas, carrots, spinach. The portal of entry is of course not through the

* The term "nutriture" is defined as the condition as to nourishment or sometimes as nutritional status. (For adequate discussion see Dann and Darby.⁹¹)

mouth but through the child's blood stream, and all nutriment must be in the form in which it can be transferred from the mother's blood stream to that of her fetus across a living tissue barrier.

At the moment of birth, as soon as respiration is established and the child's lungs are filled with air, and the necessary process of oxidation of tissue-building material begins, the way in which the infant's body gets its food suddenly becomes entirely different from that of the fetus. The portal of entry for nourishment becomes the mouth. The whole digestive system is immature at birth, and still demands a highly simplified form of food. This food, however, is still supplied through the products of the mother's body, namely, mother's milk or its substitute. During the first few days of transition from a fetal existence to that of an independent organism he depends upon mother's milk, colostrum, which is a highly specialized product adapted to the needs of the newborn.

As the child grows he needs essential substances to build his own body which the products of his mother's body do not supply or, if they do, do not furnish in adequate quantities. This is the first transition from his complete dependence on his mother's body for his food to utilization of other food material. Examples of this transition are the administering of vitamin D in some form to insure the laying down of calcium and phosphorus in his skeleton, and the supplementing of vitamin C intake by giving orange juice. Orange juice can usually be given at an early age because it contains easily digested food elements, and does not contain any large complex molecules such as are typical of foods such as meat. This is as real a stage in the infant's nutritive maturation as is walking in his motor development. The field of nutritive maturation is so new that we do not know yet what are reliable indicators of nutritive maturity. It is our belief, however, that the digestive response of the infant to increasingly complex foods is one of the soundest indicators of nutritive maturation.

The next stage in the maturation of the nutriture is when the infant is given semisolid foods, such as cereals, puréed vegetables and fruits. These are added because they supply the increasingly complex food elements the body demands. Puréeing of food reduces the complexity of the food, and this stage of the child's nutritive maturity still demands some simplification.

The stage which might be designated the "pre-mature" nutritive stage is perhaps when the child is able to tolerate well-chopped foods. This is a slight simplification of the adult's food, and is

necessary because he has not learned how to chew and has an inadequate number of teeth to masticate his food satisfactorily. It would seem highly probable that his digestive tract is in a corresponding state of maturity.

The child moves into maturation of the nutriture when he can eat solid, nonsimplified adult foods. He selects and combines them from their intact, natural form, and they are prepared for digestion and reduced to their simple form entirely within his body.

It seems justifiable to think of nutritive maturation as analogous to stages of development toward bodily maturity, which we label by terms such as fetus, newborn, infant, child, adolescent and adult.

TABLE 5.—STAGES OF MATURATION OF THE NUTRITURE

I	Fetal stage.....	Fetus is nourished from blood stream of the mother.
II	Newborn.....	Simplified and highly specialized food (colostrum) still supplied through the products of his mother's body and adapted to the needs of the newborn.
III	Infants.....	Infant dependent on mother's milk, a product of her body (or a substitute for it), essential substances added which are not supplied by mother's milk. Begins to be independent of his mother.
IV	Young child.....	Infant diet has semisolid, puréed food added.
V	Pubescent ("pre-mature")..	The diet is increased in complexity by adding well-chopped food.
VI	Mature	Child eats solid, nonsimplified adult foods, and they are prepared for digestion and reduced to simple form within his own body.

With this concept one can apply these and any other nutritive indicators to a better understanding of the reasons underlying individual differences which are not explained by age alone. It seems quite possible that a child can be five years old chronologically and yet immature nutritively. The differentiation between nutritive immaturity and nutritive failure is a field as yet quite untouched, and merits wide exploration.

Lags in nutritive maturing seem most commonly due to environmental factors such as illness, accompanied by poor appetite, and therefore are correctable under ordinary circumstances.

The experiments of Dr. Clara Davis with infants on self-selected diets give interesting and suggestive evidence of the relation of the

functional maturity to the body's demand for food of increasing complexity.⁹³

The Child's Equipment for Utilizing Food.—The digestion of food takes place in a tube, which varies in size at different levels and functionally consists of two parts, namely, the alimentary canal through which food passes and within which digestion takes place, and three accessory organs which produce juices vital to digestion and absorption of food.

The alimentary canal is a musculomembranous structure which, like the heart and lungs, is largely under the control of the involuntary nervous mechanism of the body. It is well named a canal, for it is richly supplied with fluids which soften the dry foods, and at vital points the movement of the food through the canal is regulated by circular bands of muscle called sphincters which resemble the locks of a canal. The muscular walls are well supplied with blood vessels and the membranous lining contains specialized types of vessels called lacteals through which digested food is absorbed into the blood stream without being poured into the large blood vessels directly.

The accessory organs of digestion are of two types—those which are purely mechanical in function and those which secrete fluids which are necessary to digestion itself and are connected directly with the alimentary canal by ducts. The teeth and tongue are the mechanical accessory organs and the salivary glands, the pancreas and the liver are the functional accessory glands. The secretions of the accessory glands are added to the food at two points, namely, in the mouth and again when it enters the first portion of the intestine, the duodenum.

There are three pairs of salivary glands whose ducts empty into the mouth. Their secretion softens the solid food and acts chemically on the starches through the enzyme, ptyalin, changing them into simpler compounds.

The pancreas is a gland very similar in structure to the salivary glands, though softer and less compact. It secretes the pancreatic juice which is carried to the walls of the small intestine through the pancreatic duct where it enters the duodenum with the bile from the liver through a common duct. The pancreas also has specialized cells called the islands of Langerhans, which secrete insulin, which is taken up directly by the blood stream and is then carried to all parts of the body wherever it is vital to the metabolism of sugar. The pancreatic juice contains enzymes capable

of splitting carbohydrates, fats and protein (trypsin, amyllopsin, pancreatic lipase) and changing them from their natural state to the stage where they can be absorbed into the blood stream.

The liver is the largest gland in the body. It secretes bile which acts upon fats by lowering the surface tension, breaking up the droplets and converting them into a fine emulsion like the fine droplets in cream. (The process is not a chemical change of the fat but a physical division of the fat particles.) The bile accumulates in the gallbladder, the liver secreting it continually. Cholecystokinin, a substance formed by the glands in the intestinal walls under the stimulus of fats, is liberated into the blood stream. Its action seems to be specific on the gallbladder, causing it to contract and evacuate its accumulated bile into the duodenum.

In addition to the juices from the functional accessory glands which are poured into the digestive tract are juices secreted by the glands in the walls of the stomach and by tiny glands which are found in considerable numbers over every part of the mucous membrane of the small intestine.

The glands in the stomach secrete pepsin, a protein-splitting enzyme and the hydrochloric acid necessary for peptic digestion. Pepsin cannot change large protein molecules into a form in which they can be absorbed into the blood. The partial digestion causes the liberation of gastrin from the glands in the mucous membrane of the stomach into the blood stream where it acts as a chemical messenger to all parts of the stomach and excites the various secreting cells to activity. The glands of the stomach also secrete lipase, a fat-splitting enzyme, which is effective only if the fats are in a finely divided form. When material passes from the stomach into the small intestine, the hydrochloric acid in it acts upon a substance found in the cells of the intestinal walls, and secretin is produced. Immediately it is extracted by the acid, some of it is liberated directly into the blood stream and carried to the cells of the pancreas, which it excites to secrete strongly alkaline pancreatic juice. Secretin also stimulates the liver to increase bile production. This accounts in part for the fact that the bile flow as well as the pancreatic secretion is augmented by the emptying of the stomach contents into the intestine.

The intestinal juice is generally a turbid, alkaline liquid containing small amounts of sodium bicarbonate and sodium chloride. Recent evidence indicates that a duodenal hormone known as enterocrinin is responsible for the secretory response of the

intestinal glands to food.¹⁸³ Lactase, maltase, invertase, lipase, nucleinase, protease, phosphatase, erepsin* and possibly rennin are the enzymes found in the intestinal juice. Table 6 shows the enzymes present in intestinal juice, the kinds of food they act upon and the products which result.

TABLE 6.—ENZYMES IN INTESTINAL JUICE

Enzymes	Acts upon	Products
Lactase.....	Milk sugar (lactose).....	Simple sugars
Sucrose.....	Cane sugar (sucrose)	Simple sugars
Maltase.....	Malt sugar (maltose)	Simple sugars
Lipase.....	Fats	Fatty acid and glycerol
Erepsin.....	Peptides (digestion product)	Amino acids
Nucleases.....	Nuclein, digestion product	Phosphoric acid and other components
Proteases.....	Intact protein through series of changes	Amino acids
Digestive phosphatases (activated by magnesium).....	a. { Phosphoprotein Phospholipids b. { Fats Glucose c. Glycogen in the liver	a. Phosphoric acid and "protein" b. Aids their absorption c. Glucose

THE STAGE OF MATURATION OF THE DIGESTIVE TRACT OF THE YOUNG CHILD

Salivary Glands.—At birth the salivary glands weigh about 2 gm. and are said to increase in weight about three times during the first three months and five times during the first two years. By the end of the second year the salivary glands assume the appearance of those of an adult.¹⁸² The salivary glands are ready to function at birth and may be stimulated by the presence of milk in the mouth or by a nipple. The ptyalin content of the saliva increases during the first year, and at the end of that year the concentration of ptyalin is equal to that of an adult, which is five times that of

* Erepsin is probably a mixture of several different peptidases which act on peptides of different structure and convert them into amino acids.¹¹¹

a newborn.¹⁸³ The amount of salivary secretion is scanty at birth, but in the next two to three months it increases, until at the third month drooling may appear. It has been estimated that the infant secretes from 50 to 150 cc. of saliva per day.³⁶¹

In the nursing infant, saliva acts physically by reducing the firmness of the milk clot, and therefore aids gastric digestion and evacuation. Although ptyalin is found in the saliva of the newborn in sufficient quantities to be significant, it cannot be considered important in his digestion.

Stomach.—The shape of the infant's stomach, when filled, varies with every child. The capacity of the infant's stomach, like that of the adult, is not fixed except by its maximum limit to distend. It varies widely with the size and age of the infant, so that only approximations can be made. It holds 1 to 2 ounces at birth, 3 to 5 ounces at one month, 5 to 7 ounces at six months and 7 to 10 ounces at one year, 17.6 ounces at two years; 21 ounces at four years.⁴⁰⁰

At birth the mechanisms for the gastric and intestinal phases of gastric secretion are ready to function, and during the first year the mechanism by which the body develops an awareness of its need of food and of the color of food, etc., begins to function. Gastric hunger mechanism is present in the newborn. In infants from one to six months old, the average time for onset of hunger pangs is about three hours after the last meal.²⁷³ The concentration of hydrochloric acid, pepsin and rennin is lower than is found later. Taylor obtained from 50 to 200 cc. acid gastric juice from the stomachs of the infants in his group in twenty-four hours. In the group of infants studied by Taylor, two hours after a feeding the pH of the gastric content ranged from 2.0 to 5.0.³⁶¹ In children from two to ten years, adult values are found.

Pancreas.—Scammon finds the weight of the pancreas of the newborn to be 3.5 gm. By the sixth month the weight has doubled. At the end of the first year it will weigh four times the birth weight. In the two years following the weight often is doubled, but after the third year its growth is much slower. At three years the pancreas has attained about 33 per cent of its adult weight.³¹²

Trypsin has been demonstrated to be in the intestine of the fetus and the newborn. Trypsin, pancreatic lipase and amylopsin have been found in the duodenum of the newborn before the first nursing;¹⁶⁶ thus the pancreas must begin to secrete soon after birth, and may even show some slight secretion during intra-

uterine life. The amount of secretion is small during the first few weeks of the infant's life but appears to be adequate for his needs. The capacity of the pancreas to secrete increases rapidly as the child grows. Secretin is present in the intestinal mucous membrane of the fetus and the newborn. The activity of protein-splitting enzymes in the duodenum is pronounced after the first month, although the fat-splitting and starch-splitting enzymes are feeble in the first year of his life.¹⁶⁶ Enterokinase is present at birth, and has been traced back in fetal life²⁰³ to the age of six months.²⁵⁷

Liver.—The liver in the newborn is proportionately large, occupying nearly two-fifths of the abdominal cavity and forming 4 per cent of body weight. Scammon³¹² found it to weigh from 120 to 150 gm. In the first year it more than doubles its weight. In the third year the weight has increased threefold. The relative size of the liver of the infant compared with that of the adult indicates its special importance in early life. The bile, secreted by it, plays the same part in the metabolism of food as in the adult. Experiments indicate that the gallbladder of the child evacuates well when cream and egg yolk are given.⁴⁷ The volume of gallbladder content is proportionately greater in the child than in the adult.

Intestines.—At birth the length of the small intestine of the infant is quite variable, and the variation seems to have no association with variations in body length or weight. The length of the small intestine at birth averages 338 cm. In the first year its length has increased about 50 per cent. At six years the small intestine is 60 per cent of the adult length. The duodenum of the newborn is from 7 to 10 cm. at birth.³¹²

The most marked difference between the intestine of the infant and of the adult is that in the infant the mucous membrane is more developed in proportion to the muscular layers than in the adult. The villi in the newborn are distributed the entire length of the small intestine as in the adult.

Scammon has given the length of the large intestine at birth to be 66 cm.; during the first year it increases about 26 per cent, and when the child is six years old his large intestine has attained 60 per cent of the adult length. The cecum in the infant is much smaller relatively as well as absolutely than in the adult. "The sigmoid colon is the most striking part of the intestine in the newborn. It is in general enormously distended with meconium, and as the lesser pelvic cavity is too small to contain any considerable

part of it, it projects far upward into the abdomen."* The rectum is relatively longer at birth and in early life, than in the adult. The enzymes found in the intestinal juices of the adult have been found in the intestine of the newborn, with the exception of nucleinase, which has not been studied. The intestinal juice is alkaline in its reaction.

CHILD'S ABILITY TO DIGEST FOOD

Ability to digest protein is well developed in the infant. The presence of pepsin and hydrochloric acid in the stomach, trypsin of the pancreatic juice and erepsin of the intestinal juice in the infant's intestine insure protein digestion. The ability to digest fats is insured by bile from the liver and by the lipase of the pancreatic juice.

It is probable that because of the relative deficiency of fat-splitting enzymes and bile salts, fats are less satisfactorily used by infants than by adults. However, the healthy infant can absorb almost all (98 per cent) the fat in milk in about three hours. Ability to digest double sugars such as lactose and maltose is well developed in the infant. The supply of amylopsin in the intestine during the first few months of the child's life is reported to be small. However, the research of Simchen,³²⁶ who fed healthy infants (from one to twelve months of age) on a mixture of milk and cooked flour, testing their stools for starch, indicated there was sufficient amylase to digest relatively large quantities of cooked starch. According to Ivy, "The breast fed baby absorbs approximately 80 per cent of the ash of milk and retains between 40 and 50 per cent of it. The baby receiving cow's milk absorbs less of the ash, but retains almost the same amount as the breast-fed infant. The retention of sodium, potassium, phosphorus is appreciably higher when the infant is on breast milk."†

The time required for the passage of food through the gastrointestinal tract varies markedly in infants. For breast-fed infants the average passage time is fifteen hours, with a range from four to twenty-eight hours; for the bottle-fed baby it is slightly longer.¹⁸³ As the infant grows and develops the passage time increases. In the infant food moves at a steady rate through the stomach, small intestine and colon. There are no pauses in the stomach, which acts as a reservoir, but there are brief periods of quiescence which may be prolonged when the child is disturbed significantly during

* Scammon³¹² (p. 327).

† Ivy¹⁸³ (p. 13).

feeding. In the adult, food passes through the stomach and small intestine at the same pace as it does in the infant and young child, but in the colon it may take twenty-four to forty-eight hours longer than in the infant. Slowing up of the passage of food through the colon begins soon after infancy, and in a few years may approximate the adult. As the child grows the sphincters become more vigorous in action. It is evident that the slower rate of evacuation of the adult colon is due to more powerful sphincter control and differently coordinated reflexes.⁴¹²

Let us trace briefly what happens in the child's digestive tract when he takes milk. Milk is chosen because it is a food containing a variety of proteins, carbohydrate, fats, and mineral salts. Milk enters the mouth and is not acted upon chemically by the saliva, except to render it slightly alkaline which appears to favor the penetration of the clot (formed when rennin acts upon milk) by hydrochloric acid. The proteins of milk are caseinogen, lactalbumin and lactoglobulin. Lactalbumin and lactoglobulin are in the whey. The first effect of gastric juice is to convert the caseinogen into an insoluble form, casein (curd). This change is due to the enzyme, rennin, in the presence of a calcium salt. Slow curdling, or clotting, of milk in the stomach is more favorable to digestion than rapid curdling, because the clot is looser, thereby permitting better penetration of the gastric juices and the whey is expressed more slowly and will interfere less, either through its salt content or its fluid, with the digestive juices. The proteins are changed by the pepsin and hydrochloric acid into the proteose or peptone stage only. Some of the milk may pass out of the stomach so quickly that its caseinogen is not changed.

In the upper part of the small intestine the peptones and proteoses are acted upon by trypsin and erepsin and broken down into amino acids which can then be absorbed into the blood stream. Any curd that passed into the duodenum undigested is broken down by trypsin. The lactose (milk sugar) is split by the lactases of the intestinal juice into glucose and galactose which are simple sugars and ready for absorption. The fats of milk are in minute droplets, and are split by the gastric lipase in the stomach or by the pancreatic lipase in the small intestine into fatty acids and glycerol. Much of the fat is presented for absorption in a liquid state. The gastric lipase is relatively important in infancy, since the milk fats are emulsified. The salts of milk include calcium, sodium, and potassium as phosphates, citrates and chlorides.

As the child grows older and takes more complex foods, different enzymes are required to change a greater variety of food components. However, the fundamental process is the same, changing them from a natural, intact form to one which can be absorbed into the blood stream.

TRANSPORTATION OF FOOD ALONG THE DIGESTIVE TUBE OF THE CHILD

The food to be digested is accepted into the body through the mouth, which is provided with the mechanical means for preparing it to be swallowed. The teeth function in grinding the food, the tongue in mixing it with the saliva poured into the mouth from the salivary glands and in keeping it pressed between the grinding surfaces of the teeth. After the mass of food has been moistened and lubricated by saliva, it is rolled by the tongue and hard palate into a bolus (rounded mass) and the tongue forces it back into the pharynx.

The swallowing movements of the infant show no important differences from those of the adult. Swallowing of food consists of three phases, localized in the mouth, in the pharynx, and in the esophagus. In the early months of life, the initial phase of swallowing is involuntary and does not become functional until several months after birth.²⁷⁴ Until swallowing becomes voluntary the infant does not swallow food or liquids put on the anterior part of the tongue but pushes them out. Therefore in feeding him with a spoon the food or liquid should be placed in the back of the mouth. The pharyngeal phase of swallowing is very complex and is accomplished by one of the most delicately coordinated reflex mechanisms found in the body. In the esophagus, studies have shown peristaltic waves sweeping downward from the upper end of the tube to the stomach in a continuous progressive movement. In general, there is one esophageal peristaltic wave for each swallowing movement initiated in the mouth. Water or semiliquid foods immediately pass rapidly down to the lower end of the esophagus by the action of gravity. The peristaltic waves coming down a few seconds later merely sweep the fluid past the sphincter guarding the entrance into the stomach.⁶⁸

In the first few months of life the child ingests his food by sucking, accomplished by depressing the jaws which tends to produce negative pressure in the mouth cavity. The mouth cavity in the newborn is very shallow; the hard palate is flat and has not

acquired the concavity characteristic of the adult palate. In the act of sucking the infant uses the tongue, hard and soft palates, the two cheeks, the uvula, the gums and the lips. The act is greatly facilitated by the sucking pads, small masses of fatty tissue in each cheek.

Movements of the Stomach of the Infant.—Peristaltic action in the normal infant's stomach is not easily observed because of the mechanics of making such observation. Peristalses are not as marked as those observed later in the child and the adult. The peristaltic mechanism is present and may manifest itself when the infant is a few weeks old; this has been established. The lesser peristaltic activity of the infant's stomach is due to either incomplete development of the neuromuscular mechanism responsible for peristalsis or low tone of the sphincter. Ivy¹⁸³ says x-ray studies of the normal infant's stomach during the early months show that it evacuates food chiefly through a contraction of the stomach as a whole, somewhat like the urinary bladder, rather than through a peristaltic mechanism.

As the child grows older and his peristaltic mechanism becomes more mature, the peristalses become more marked and the food he is taking becomes more complex. At this period very soon after food reaches the stomach peristaltic waves are started. At first the waves arise midway between the opening from the esophagus into the stomach and the opening from the stomach into the small intestine and pass from left to right toward the pylorus (opening into the intestine) at the rate of about three per minute. At this stage the main body of the stomach containing the bulk of the swallowed food is relatively quiescent. Certain parts of the food mass begin to move through the pylorus; as digestion proceeds, the peristaltic waves originate closer and closer to the esophageal orifice encroaching on the main mass of food. Finally, two or three hours after a meal is eaten, the waves originate almost at the esophageal opening and sweep over the stomach. In one to four hours after the food is eaten the stomach has usually poured its contents into the small intestine.

There is a wide variation in the time that food remains in the stomach of a child. The tone of the pyloric sphincter (a ring-like muscle surrounding the opening into the small intestine), the motility and tone of the stomach, the character of the food, the consistency of the gastric content and its acidity, and hunger and appetite influence the emptying of the stomach. Acid irritation of

the duodenum is a factor in delaying the emptying time of the stomach.

Intestinal Peristalsis.—There are, according to Alvarez, two main types of activity in the small intestine: (1) a rhythmic segmenting or swaying or pendular movement and (2) a through wave or “peristaltic rush.” In addition to these two movements there are tonus waves, which in the presence of obstruction may perhaps turn into slow, powerful, traveling contractions. Peristaltic rushes commonly originate in swallowing movements, or start in the duodenum about the time a gastric wave reaches the pylorus. As a rush starts in the duodenum an impulse shoots down the length of the bowel and serves several purposes: often to start a number of rushes here and there along the bowel, and to increase the tonus and activity of the bowel out ahead of the main rush wave, so that it will be stopped before it goes too far. If it were not for this mechanism everyone would probably soon die of diarrhea. The movement due to “rhythmic segmenting” mechanically breaks up the chyme* into finer particles, and thoroughly mixes it with pancreatic and intestinal juices and bile. In addition, all parts of the now liquid mass are brought into contact with the absorbing surface of the intestinal walls, through which digested food enters the blood stream. These swaying movements continue for a time, then a peristaltic wave will move the material onward into the next segment of the intestine, where the process is repeated. Slowly and interruptedly the food moves finally into the large intestine. Usually by the time the large intestine has been reached digestion has been completed, and nearly all of the digested food has been absorbed. “The main function of the nerves in the intestines seems to be to expedite conduction and to correlate activities of the muscle fibers.” †

ABSORPTION OF PRODUCTS OF DIGESTION

By the chemical changes brought about by digestive juices and by the physical changes induced by the peristaltic movements of the digestive tract, most of the insoluble constituents of the food have been converted into soluble substances of smaller molecular size which can pass into the blood. The products of digestion in the alimentary tract are in a closed tube, and the blood and lymph

* Chyme is the thick, grayish, liquid mass into which the food is converted by gastric digestion.

† Alvarez⁸ (p. 320).

are in other closed tubes. The passage of the material across the boundary between two biological membranes must be accomplished if the products of digestion, the salts, the water and the vitamins are to become available for use by cells of the body. This transfer is never accomplished by open ducts but is effected by the processes of osmosis, diffusion and dynamic cell activity. The transfer of the dissolved material from the intestines to the body fluids is known as absorption.

Absorption is a process of osmosis and diffusion achieved by means of the activity of the living cells of the mucous membrane of the intestine.⁶⁸ Apparently the cells lining the intestine are capable of actively taking up material from within the intestine (lumen) and passing them into the blood. It depends also upon the activity of the living cells and it involves cellular work with the expenditure of energy. Proteins and carbohydrates seem to be taken up by the blood stream through capillary endings which differ histologically from the lacteals which take up the fats. This structural difference is directly related to difference in the rate of their absorption. The layer of cells lining the walls of the intestine will permit certain materials to pass through and reject others. For example, sodium chloride is promptly absorbed and magnesium sulfate is not.

After protein has been broken down and simple sugars have been digested from starches, they are absorbed directly into the blood stream. They enter the capillaries of the intestine and ultimately find their way either into the tissues where they are metabolized and used or into the portal vein, which transports them to the liver. The fat molecule is broken down to fatty acid and glycerol in the intestine; but in the process of absorption, even as the molecules are passing through the absorbing cells, this chemical process is reversed, and at least some of the fatty acid and glycerol is converted into fat again.⁶⁸ The tiny droplets enter the lymphatic vessels of the intestines, which, in turn, finally empty into a large vein in the left shoulder region.

Many of the inorganic substances in the food are absorbed, although to a varying extent. Those which form insoluble salts with calcium are not well absorbed and are excreted in the feces. An example is the insoluble calcium soaps formed when a calcium compound combines chemically with a fatty acid.

EVACUATION

There passes into the large intestine the residue of undigested food and a considerable quantity of water which has been taken with the food or derived from the digestive juices. Here the feces are formed.

The semiliquid material is ejected in spurts into the cecum. The ileocecal sphincter prevents it from regurgitating into the ileum. The feces accumulate in the cecum and ascending colon, where through the absorption of water they are changed to a soft, semiliquid mass. "Much progress of material in the human colon seems due to pressure exerted by the new material coming into the cecum from the ileum. Contractions are rarely observed roentgenographically. A few times a day there are 'mass movements' which carry material from the transverse colon down to the sigmoid loop or rectum. These movements tend to take place after the first meal of the day."* This is one of the reasons why children are put on the toilet after breakfast.

TABLE 7.—PERCENTAGE OF CALCIUM AND PHOSPHORUS EXCRETED AND RETAINED

Age	Percentage of Calcium Intake			Percentage of Phosphorus Intake		
	Excreted in Urine	Excreted in Feces	Retained	Excreted in Urine	Excreted in Feces	Retained
6 mos. ⁸⁹ . .	4.6	88	7.4	52	41	7
4 yrs. ²³⁶ . .	13.0	61	26.0	56	27	17
5 yrs. ²³⁶ . .	10.0	70	20.0	55	31	14

The digestive tract is one of the paths for the excretion of minerals from the body. Among the inorganic substances claiming especial attention are calcium and phosphorus. Undue loss of these substances is very significant in children. Table 7 gives the results of some studies made on calcium and phosphorus excretion. It was found that the larger percentage of calcium was

* Alvarez⁸ (p. 322).

excreted in the feces and of phosphorus in the urine. The percentage of calcium retention ranged from 20 to 26 for children of the age group studied. These figures are similar to those obtained in the studies of Mitchell and Outhouse.

An excess of phosphates increases the excretion of calcium by the colon in the form of insoluble calcium phosphates or calcium soaps. The amount of phosphates in the urine and feces varies with the amount of calcium and alkaline bases in the food.

The centers for the control of colon activity are located in the central nervous system, and this fact indicates that its activity may be not only affected by local reflexes but also by habit formation and nervous states. The sigmoid and the rectum are very sensitive to distention or irritation, and the passage of fecal matter into the rectum gives rise to the sensation that Ivy¹⁸³ designates the "call to stool." This sensation sets in motion the comparatively complex reflex mechanism of defecation. In the infant this mechanism is not under cerebral control. When it does come under cerebral inhibitory control the mechanism of defecation may be conditioned, and the "stool habit" formed. The entire colon is quite active during defecation, but the portion of colon content that is evacuated varies considerably.

Feces.—The feces consist in large part of intestinal secretions and excretions, of cellular material from the intestinal walls, of bacteria and food residues, which in turn depend on (1) the composition of the food eaten, (2) the capacity for digestion and the digestive activity of the stomach and intestine, (3) the irritability of the digestive tract, and (4) the capacity for absorption.

The meconium, which is the first discharge of the colon of the newborn, is composed of bile, mucus, cellular waste, intestinal secretions, fat, hair and vernix caseosa swallowed with the amniotic fluid.

EXCRETORY SYSTEM

There is a constant flow of materials through the human body which, in the process of metabolism, either yield up their energy or are subject to more or less complex chemical transformation. When these processes have been completed the useless or injurious end-products are eliminated from the body. The mechanism for eliminating some of these wastes has been discussed in the sections on the respiratory and digestive system. Since there is confusion in many persons' thinking between elimination and excretion, it

may be well to state the way in which these terms are used in the text. Elimination means the evacuation of those hollow organs in which waste material has accumulated, and it depends essentially upon mechanical changes (such as pressure) which forces waste into the outside world. For example, the voiding of urine from the bladder. Excretion deals with the extraction of wastes from the internal environment, from circulating body fluids and the passing of them into temporary waste-depositories; into lungs, bladder and gastro-intestinal tract. Excretion is, "in large part, carried out by cellular activity, involving cellular work and the expenditure of energy by the cell.... This cellular activity may be modified by physical forces such as osmosis, filtration, and diffusion but cannot be accounted for entirely by them. Activity of the living cell contributes largely to the phenomena."*

The excretory system consists of the lungs, the kidneys, the liver, the colon. The work of the kidney will be discussed in this section. The other organs of excretion have been treated under other systems of the body.

The Kidneys.—The kidneys lie back of the abdominal cavity, one on each side of the vertebral column. They function as excretory organs in removing from the body useless and injurious end-products of metabolism. They also aid in maintaining in the internal environment the conditions necessary for life by playing a part in regulating the composition of the blood. The urine which is constantly excreted by the kidneys is stored in the bladder until eliminated.

Before birth the kidneys excrete urine and some is collected in the bladder. This is relatively little in contrast to the amounts excreted after birth. The kidneys at birth are sufficiently mature to respond remarkably well to the sudden load thrown upon them. In weight they are about one-twelfth that of those of the adult. In the first six months their weight has doubled; by one year it has tripled and by five years it has increased fivefold. It is evident that as the kidneys increase in size the bladder must make corresponding growth.

Chemical analysis of the urine excreted by the adult kidney shows that normally it contains salts, urea (product of protein metabolism), uric acid (the end-product of nucleoprotein, abundant in cell nuclei), creatinine (from protein and muscle metabolism), and several other materials. Urine is derived from blood.

* Carlson and Johnson⁶⁸ (p. 335).

Everything which is present in the urine has first been present in blood from which the kidneys "separate" it.*

Quantity of Urine Excreted.—During the first few days of life the urine is scanty and concentrated, tallying with the small amount of fluid taken and the large water output from the lungs. In contrast to the adult who excretes approximately 1500 cc. daily, the baby one or two days old excretes 15 to 60 cc. The one- to three-year-old excretes 500 to 600 cc. and the three- to five-year-old 600 to 700 cc. The amount excreted varies considerably, since it is influenced by many factors such as liquid ingested, the environmental temperature, and the state of the digestion or the nervous system.

URINATION

The process of urination is first under involuntary control and later under voluntary control. The newborn urinates through reflex activity, presumably under the dominance of subcortical centers. As was stated on page 147 the cerebral cortex is very immature at birth. Even at six months the part of the cortex which governs urination is not functioning, according to the evidence offered by McLellan.²³⁵ McGraw,²³² in a study of two sets of twins, indicated the sequential changes in behavior which accompany and denote the development of voluntary control in urination. At the time when the child begins to pay attention to the act of urinating and its result, he shows a sharp rise in his response to training. It is possible that this time corresponds with the maturation of cerebral sensory centers which mark bladder sensibility. There is also probably some development of the cortical centers of the motor areas governing sphincter control. A drop in achievement follows which seems to correspond to a period of rapid advancement in associational behavior and the beginning of discriminative and generalizing powers. The subsequent rise in achievement indicates that these powers have become integrated with the act of urination. There is probably another regression phase when the child begins to engage in fantasy and becomes interested in things beyond the immediate situation. The newly developed cortical centers are still not well integrated. When these centers become well integrated the child can integrate his many interests with his responsibility for controlling urination.

Some children achieve this point sooner than others. The speed

* For exact chemical analysis see a textbook on biochemistry, or Carlson and Johnson⁶⁸ (p. 335).

with which this maturation process takes place influences the time when he develops full responsibility and the ease with which he achieves it (see p. 242f. for discussion of toilet training). If the child is very slow in maturing he may not become reliable until a rather late age. Such a child should not be confused with a child who has gained control and then regressed because of some physical or more likely psychological cause. Such a child lacks control not because of immaturity but because of some impact of the environment upon him.

In the first and second days of life the infant voids urine from two or three up to six times. After this, urination is frequent throughout infancy, varying from four to six or even thirty to forty times in twenty-four hours. After bladder control has been established the frequency usually varies from six to eight times in twenty-four hours. (For discussion of evacuation of the bowels see page 245f.)

PROBLEMS FOR CLASS DISCUSSION

1. You are an assistant in a children's health clinic and a mother asks you what foods to give her child. Upon what facts would your decision be based?
2. You are participating in a parents' discussion group. The subject is toilet training. What facts in physical growth would be helpful to the parents?
3. The class will list the misconceptions of the average person regarding the processes of digestion and excretion and a panel chosen from the class will present evidence to disprove these incorrect ideas.
4. A pale little boy is brought to the nursery school; his parents have in their hands the pediatrician's report of the physical examination. Interpret for them the items on such a report and their significance to the development of the little boy.
5. An orthodontist is addressing a group of parents of young children. What important facts can he present to them?

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The Care and Feeding of the Growing Child

For a number of years we forsook the wisdom of our forebears, and, thinking ourselves very learned and scientific in our methods, we fed and cared for infants with a constant eye on the clock. With the most careful arithmetic we compounded and measured exact formulas, which mothers were led to believe were exactly suitable both in quality and quantity for the infants for which they were ordered. At the same time we talked and wrote a great deal about the necessity for establishing regular habits and about the complete dependence of the young infant. As we have concentrated less on the clock and the mathematics of infant feeding and have spent more time looking at the infant himself, we have become more and more impressed not only with the individuality of babies and the consequent divergence of needs, but also with the relative independence of the infant and his ability to utilize his environment to his own best advantage when he is given the opportunity. Perhaps our fundamental error in the past was looking first and foremost at the basic needs of newborn infants and young children in general, and then plunging into the task of meeting these needs without considering either goals or individualities.

Goals of Maturity.—In planning for the care and guidance of the newborn baby, the infant and the young child, the first consideration, to be thoughtfully undertaken even before the birth of the child, is that of ultimate goals. Every educator, whether parent, school teacher or college professor, is, or should be, interested in the development of mature men and women who are *physically healthy* men and women, with good common sense in observing rules of health in order to maintain themselves in a state of buoyant, energetic health without overemphasis upon health rules or an overweaning servitude to them; *intellectually independent* persons, able to think and to act for themselves in their own best interests, and, consequently, in the best interests of their associates and society in general; *emotionally mature*

happy, well-adjusted individuals with an inner security and confidence which makes it possible to be and to have friends, and to achieve happiness in marriage and other major life adjustments and *spiritually mature* persons with a workable philosophy of living which makes it possible to meet life with wisdom and high courage always.*

Goals for Children Entering School.—How much of this maturity shall we expect of the child when he is ready for school? Certainly we shall not expect the adult maturity which we have just outlined. However, more learning occurs in the first five-year period of life than in any later five-year period, and, in general, the five-year-old who develops at an approximately average rate in all areas can be expected to have achieved certain developmental tasks, that is, to have achieved a five-year-old maturity. Among the maturities he should have achieved in the realm of the physical are the following: he will have established good eating habits and the ability to accept and digest almost any foods except a few items such as ham, corn, pie, or other tough fibered or too rich foods which he probably will not have been offered; he will be able to handle his spoon and fork well and may be able to use a knife a little, but will not have acquired perfect table manners by any means; he will have control over eliminative functions and be able to manage his own clothing at the toilet and go when he needs to without announcing his need; he will be able to dress and undress himself if buttons and fasteners are not too small and are accessible; he will be able to accept routine visits to the pediatrician as a matter of course and will want to know how much he weighs and how tall he is and sometimes can remember the figures to tell Daddy, although he himself may have very little concept of their meaning; he will know that cuts and scratches heal faster when treated with some antiseptic and bandaged and will sometimes voluntarily take time out from play to run in with a request for a hurried application of the antiseptic and a bandage.

Intellectually, the average five-year-old has achieved considerable independence. He is capable of reasoning and of rather complex problem-solving, and is very responsive to adult suggestion when he is aware of its reasonableness.†

Socially, the five-year-old can make and keep friends. He is capable of very real and lasting attachments in his own age group.

* For further discussion of goals, see Chapter X.

† For further discussion of these maturities, see Chapter IX.

He knows a great deal about sharing and waiting for turns and is quite capable of practicing these skills without constant adult reminders. He often shows a high degree of social sensitivity.

Emotionally, too, the five-year-old has a fair measure of control. He has long since said adieu to most of his temper tantrums and learned to verbalize his pleasure or displeasure. The latter he still verbalizes with as great frankness as the former. He gives way to tears rarely, unless he is ill or overfatigued.*

The five-year-old has not developed a definite conscious philosophy of life, of course, but he does have a substantial degree of physical and moral courage, and he has many feelings and attitudes that will be the basis of his later philosophy.

It is impossible to separate the physical care from the psychological care of the infant and child. Whether the mother is conscious of the fact or not, both go on simultaneously and both aspects of the child's growth are affected by both aspects of his care.† How then shall we plan to meet physical needs to best foster psychological needs at the same time?

Individual Differences.—Our democratic American heritage is based upon respect for the individual, an ideology basic in any really creative society. Recognition of difference is, of course, the foundation of respect for the individual.

While ready, to a degree at least, to recognize difference in adults, we have failed to recognize it in children; or, recognizing it, have, nevertheless, failed to respect individual needs in the educational programs we have set up either in the home or the school. For example, we have expected all babies, except perhaps a few premature or very small infants, to fit at once into a four-hour feeding schedule; we have expected all children to enter school at the age of five, if school begins at the kindergarten level, or at the age of six, if it begins with first grade, and we have expected all children to learn to read by the end of a year in the first grade. We have been guilty of zealously endeavoring to teach health routines, reading, writing and arithmetic, and manners and consideration for others without regard for the maturational level of the organism, forgetting that there is no learning without response on the part of the organism and that there is no response without functional maturity. We need to remember that "an environment exists

* For further discussion of social and emotional maturities, see Chapters X and XI.

† For enlargement of this thesis see Chapter X.

and is effective only when the possibility of a response also exists in the organism.”*

More recently, as pointed out in Chapter I, there has been increasing awareness not only of individual differences in inherited traits in children but also of individual differences in rates of growth and maturation. Certainly, any program of physical care and psychological guidance which fails to take cognizance of such differences and to plan specifically for the individual will not be optimal for that individual.

Cultivation of Independence.—If independence and the ability to use one’s potentialities to their fullest capacity are major goals of care and guidance, it is logical to seek to cultivate independence and personal responsibility in the control and use of one’s faculties. This is best accomplished by setting up an environment at the beginning of life which permits frequent practice under judicious supervision of all functionally mature abilities in order that the individual may cultivate facility in their use. We cannot superimpose education and expect to achieve our democratic ideal of a creative society in which the individual is respected and finds opportunity for optimum development of his talents. Instead, we must surround the individual with an environment from which he can select appropriate tools for building an inner discipline and for developing independent, self-initiated and controlled abilities.

We study the newborn, then, and from his first day of life endeavor to let him use fully all of the abilities which he possesses. As he acquires new ones, we give him opportunity to exercise these too, always watching for signs of maturity so that we may permit independence of control as soon as the organism is physically and psychologically capable of assuming it.

BASIC PHYSIOLOGICAL NEEDS

With this background of ultimate and early childhood goals and philosophy, let us look more specifically at the basic physical needs of infants and young children and consider how we shall provide an environment in which these needs can be so skillfully met that the maturing organism may achieve at his own optimum rate the goals we have set. One of these basic physical needs, the need to be bodily active, has been discussed elsewhere (Chapter X). A second basic need, the need for sexual functioning, is of primary concern at a later period in the child’s life. The third, the

* Olson²⁷⁰ (p. 1).

need for a feeling of bodily comfort and well-being, has many aspects, and it is with the various factors which contribute to this feeling of bodily comfort and well-being that we shall concern ourselves in the remainder of this chapter.

Oxygen and Well-Being.—In utero the fetus obtains his oxygen through the placenta. It has been shown that at the time of birth the maternal arterial blood is usually 95 per cent saturated with oxygen while that of the fetus is only 50 per cent saturated.¹⁰³ However, the fetus with his high red blood corpuscle count and his high hemoglobin level seems to maintain an adequate supply. At birth the infant is required to shift immediately to the use of his lungs as organs of respiration. However, in the normal full-term infant the organs of respiration are fully functional and take on the task of oxygen supply at once. Indeed, although there is still controversy as to whether or not this is physiologic or pathologic, there is ample evidence both from animal experimentation and the study of humans that respiratory activity frequently occurs in utero. Of course the natural source of oxygen is fresh air. It is even more important to provide an abundance of this for the infant or young child than for the adult because of the child's more rapid metabolic rate. Care must be exercised in the case of the young infant, however, that fresh air does not also involve exposure to cold.

Warmth and Well-Being.—The newborn infant has been accustomed to the constant body temperature of his uterine environment, and care must be taken at least during the first few weeks of life to protect him from sudden temperature changes. An air-conditioned room with the temperature from 80° to 85° F. and the humidity constant at 55 per cent is ideal for the first few weeks, with gradual lowering of the temperature so that it will be from 70° to 75° and finally from 65° to 68° when he is running around. However, this is not always possible in the hospital and is perhaps rarely possible at home. To compensate for this, attention should be given to the bed and bedding, the clothing and other things which serve to contribute to the maintenance of body temperature.

The first bed is usually a bassinette or straight-sided clothes basket, or even a sturdy cardboard box, although it may be the full-size crib which will serve all through infancy. Whatever is used should be large enough to give the infant ample room to move his head and wave his arms and legs freely. Because he will move a great deal and may bump the sides, and also to protect him from

drafts, some kind of soft lining, such as a quilted pad, is very useful around the inside of the basket or crib. Canton flannel sheets are softer than muslin or percale and do not require ironing. Tight springs in the crib and a firm mattress are conducive to good posture.

Clothing Important to Bodily Comfort and Well-Being.—The first clothing should usually be planned for only the first six months, as by that time most babies will have outgrown many of the things that fitted at birth. The following is a good minimum list:*

Diapers	3-4 doz.
Shirts (long or short sleeves according to climate)	3-4
Abdominal bands	3
Nightgowns (or wrappers)	5-6
Sweaters	2
Flannel squares or baby blankets	2-3
Warm hood (if climate is cold)	1

Briefly, the principles to be observed in the selection of clothes are: (1) Safety. Drawstrings and unnecessary tapes and ribbons may be dangerous. (2) Ease in laundering. Everything should be washable, and, if the mother is to do the laundry, materials which do not need ironing save much time. (3) Ease in putting on or taking off. Again the time-saving factor is important, but even more important is the comfort of the baby who does not like having things pulled on and off over his head. One would like any routine as frequent and as permanent as dressing or undressing to be a pleasant one from the very beginning. Gowns which open down the back are not only easier to put on and take off but offer the additional advantage of having to be laundered less frequently, since the flaps can be folded back at the bottom and do not need to be wet each time the diaper is. For the toddler and young child self-manipulation must be considered. Clothes which are easy for the child himself to put on and take off should be provided. (4) Warmth and coolness. In a constantly warm climate the baby may need no clothing except his diaper, and the toddler and young child only a sunsuit. When warmth is needed, care must be taken to see that the child is warm enough but not so warm that he will perspire and later get chilled. Wool is often irritating to the delicate skin of the very young infant, and if it is used at all in shirts

* United States Dept. of Labor, Children's Bureau, Publication No. 8, *Infant Care*, p. 14. A good discussion of the way to select clothes may be found in the same bulletin.

and other garments next to the skin, it should be mixed with cotton or rayon. It is usually better to use cotton shirts and when wool is needed for warmth to put it on the outside in the form of a sweater. (5) Freedom of movement. At any age clothing should be light weight and so designed as not to hamper freedom of movement in any way.

Relation of Bath to Bodily Well-Being.—Especially when the baby is bathed, care must be taken to see that the room is warm and that the baby is protected from overexposure. His skin surface is large in proportion to his body weight, and quite serious heat loss can occur as the result of evaporation of moisture from this relatively large area. This danger of heat loss is only one of the reasons why a number of hospitals have eliminated both the initial and daily bath during the newborn baby's stay in the hospital. The other and more important reason is that these babies whose skin surface is not rubbed nor handled as much as is necessary during either an oil or a soap and water bath develop fewer infections.^{10, 309, 332} Many physicians now claim that until the infant is creeping and actually getting dirty, bathing only three times a week is better both because it is less drying and irritating to the infant's skin and because this regimen gives his mother more time for adequate rest herself. The bath when it is given should be given at a time when the baby is awake. One never likes to wake a sleepy baby for this procedure, certainly not after the first few weeks when the baby has learned to wake and to stay awake for brief periods, for one would have the bath from the very beginning a happy time when the mother and baby, and frequently the father and baby, can have fun together. The room should be quite warm for the bath, so that the baby can have perfect freedom from blankets and clothes and can kick and exercise and so that the person giving the bath will feel no need to hurry. The baby is more apt to be perfectly relaxed and to enjoy the procedure if the hands handling him are skilled and at the same time unhurried. As soon as the baby learns to reach out and grasp things he will want the wash cloth and later the soap. It is well to recognize his urge as the beginning of self-help and have an extra cloth that he may hold. Later he will want to have the soap, and still later he will dab at his own knees with the cloth. When he becomes aware of the stopper he will want to pull it from the tub and to put it in. Thus, gradually, he learns to take over bath procedure himself.

Importance of Fluids to Bodily Well-Being.—Because of the higher metabolic rate and the greater excretion and evaporation from the proportionately larger skin surface, the infant or child requires much more fluid in proportion to his weight than does the adult. In fact, the infant requires daily 100 to 150 cc. per kilogram of body weight (1.6 to 2.2 ounces per pound), or a little more than three times as much per kilogram as the adult. While the infant who is breast fed and getting enough milk to satisfy his nutritional needs ordinarily gets enough fluid in the milk to satisfy his fluid needs, it is still well to offer water two or three times a day at some time between feedings when he is awake, so that he learns early to drink it. For the artificially fed baby the doctor will either plan the formula to include enough fluid, or will expect the baby to drink enough between feedings to make up the difference. In any case, it is well to offer water between feedings. If the baby drinks a great deal of water when the weather is not warm enough for excessive skin loss, the mother should suspect that the baby is not getting enough food. The child who has been offered water during infancy can usually be trusted later to drink enough water to meet his needs.

Food a Part of Bodily Well-Being.—Food, like oxygen, is provided for the unborn fetus by the placental blood, but after birth it must be ingested by the infant by way of the oral cavity. During the first few days of life the digestive tract of the newborn must begin to digest and absorb food so that his body may have adequate nourishment. Nature provided for such a transition period in the secretion of colostrum, a highly specialized, simplified form of mother's milk, adapted to the ability of the digestive tract of the newborn.* It contains less fat and more protein and ash than does mother's milk when the flow is completely established and it coagulates with heat. The transition period for the production of colostrum may be three to four days or with some women twelve to fourteen days may elapse before true milk comes.

When he can digest and absorb his mother's milk, the infant begins the third stage in his progress toward maturation of the nutriture (see p. 168). The mother's milk is nature's food for the infant. It is easily digested and is best suited to meet the infant's physical needs. Cow's milk contains about three times as much protein, almost four times as much calcium and about six times as much phosphorus as the mother's milk, but the protein of

* For discussion of digestive tract of infant, see page 174f.

cow's milk forms a heavy curd in the stomach, while the mother's milk, having less casein and more lactalbumin, forms a finely divided, flocculent mass which is easily digested by the infant. The fat of human milk is in a fine emulsion and contains few volatile fatty acids.

Food Requirements of the Lactating Mother.—If the infant is to receive his nourishment from his mother's body, she must eat the food, digest and absorb it, and the mammary glands must take from the blood stream the elements they require to secrete milk. It has been demonstrated that the quantity and quality of the milk secreted may be affected by the size and anatomical structure of the mammary gland, the amount and kind of the food intake; heredity; environmental conditions, such as fresh air, sunshine, the amount and intensity of work, rest and exercise; emotional make-up of the individual as well as extraneous disturbances.

The diet of the nursing mother like that of the pregnant mother is important, not only in producing a healthy child and protecting her own health, but in determining her ability to nurse her child. The foods included in the diet during lactation should be practically the same as those during pregnancy for in each case the purpose is to supply the proper nutrients needed by the bodies of both mother and child. The choice of food and the food requirements for the mother in pregnancy are discussed in the preceding section on pages 90 to 99. These apply to all intents and purposes in lactation. The nursing mother may find, however, that her body demands more, and she can eat with zest an increased amount of food. The addition should be made by increasing all food substances, not a single item.

How much should a mother increase her food intake to meet the increased demands of lactation? The mother can almost blueprint her increased requirement. Every ounce of milk the mother secretes represents 20 calories of energy; an infant needs $2\frac{1}{2}$ ounces of milk for every pound of body weight each day during the first six months of his life. If a baby weighs 10 pounds and requires $2\frac{1}{2}$ ounces per pound, then his daily intake should be 25 ounces of mother's milk. This amount of milk will require 500 calories. Some authorities believe that additional energy is needed for the work involved in converting the food into milk and add 10 per cent to the energy expenditure per ounce making it 22 calories. The total calorie need for the 10-pound baby would be 550 calories. As the infant increases in weight, the demands on the

mother increase; if enough food is not eaten, lactation may proceed at the expense of the mother's body and the amount of milk secreted decrease. It has been observed that the composition of milk changes as lactation progresses and that "the mammary gland appears to adjust itself to the nutritive needs of the child, and a direct relationship seems to exist between the rate of growth of the infant and the decline of various milk constituents. The correlation was first suggested by observations showing that the rate of decrease in the concentration of nutritive building-material is proportioned to the length of time needed for the young to double its birth weight. Moreover, Telfer secured data that showed

TABLE 8.—EFFICIENCY IN MILK SECRETION OF LACTATING WOMEN: AVERAGE DAILY FIGURES DURING A 60-WEEK PERIOD*

Subject	Calorie Intake	Milk Secretion			Gain or Loss in Weight
		Cc.	Cal.	Percentage of Cal. Intake	Kg.
VI.....	4300	3134	2100	50	-7.6
VII.....	4600	2366	1500	33	-3.2
VIII.....	3800	1419	1200	30	+11.4

* Macy et al.: *The Journal of Nutrition*, 1932. Courtesy of the publishers.

that, as breast feeding progresses, the mineral composition of the milk adjusts itself closely to the needs and mineral retention of the baby. Others have suggested that decreased concentration of the milk constituents is counterbalanced by increased quantities of milk ingested by the baby."*

The dietary demands upon the mother's body are threefold: there must be adequate food to maintain her own body in health and to meet her energy needs; the food essentials from which the mammary glands can build up human milk must be supplied; and an additional allowance must be made for the energy needed for the mammary glands to do their work. Macy and

* Macy²³⁷ (p. 463).

her co-workers demonstrated in their studies the high calorie intake of the three lactating women whom they observed during the reproductive cycles. Table 8 shows their results and illustrates the increased demands made upon the maternal organism.

Variation in Quantity of Milk Secreted.—Macy²⁴² and her co-workers have shown that the variations are marked in the quantity of milk secreted by the individual mother from day to day, and in the quantity of output from week to week. The gradual increase in milk flow is evidently peculiar not only to the individual but also to each particular lactation period. The average daily output of milk in each of three women studied by them from the sixth week through the fourteenth month of lactation was 2602 cc. for one lactation period in one subject and 3134 cc. in another lactation period in the same subject, 2366 cc. for another subject, and 1419 cc. for the third subject. They demonstrated also that the total quantity of breast milk produced during a lactation period depends not only on the individual's immediate capacity to produce but also on the demands placed on the mammary glands and on the duration of the lactation period. Their results showed that, if augmented milk production is to be secured, the milk should be removed from the breast at regular intervals and as completely as possible. Their observations on these three women showed that excessive exercise and heavy work tend to depress maximum quantity output of milk. Nervous factors such as excitement, fear and anxiety have been known to lessen the flow, and severe shock may cause complete cessation.

Protein Intake.—Animal experiments have proved that protein has a specific influence in the production of milk. Eckles and Palmer found that they could increase the milk yield of dairy cows by increasing the amount of protein in their ration. Reducing the protein reduced the output of milk, and the cows lost weight. Rat experiments have given convincing evidence of the improved quality of milk when the nursing mothers were on a high protein intake and in the increased growth, in a given period, of their young as compared with the young of nursing mothers on a low protein intake. At the present time we have no optimal standards for lactating women. The studies of Macy and her co-workers³²⁵ showed that the average daily protein intake for the three women studied was 160, 165 and 150 gm. respectively, an average of 2 gm. per kilogram of body weight. Their respective milk output represented 33, 25 and 18 gm. of protein or 21, 15 and 12 per cent,

respectively, of the intake. The women who were studied were successful in child bearing and had a marked ability to produce milk. Macy's investigation showed that their total food intake was increased approximately 60 per cent in lactation over that of pregnancy; that animal protein predominated over vegetable protein in their diets during pregnancy and lactation, and dairy products furnished the largest single source of minerals, proteins and energy.

Research with rats shows that the kind of protein is an important factor in determining the success of lactation. The protein should be chosen from the foods containing large amounts of essential amino acids (milk, eggs, meat, cheese and fish). Since the only food element so far found capable of stimulating the flow of breast milk in animals is protein, the mother should include in her daily diet a quart of milk, an egg and a serving of meat or fish.

Other Food Essentials.—The nursing mother needs to increase her intake of minerals and vitamins above the amount taken during pregnancy, with the exception of iron. It is especially important that during lactation there should be sufficient calcium and phosphorus in the diet so that the mother's bones and tissues may be protected and not drawn upon for supplies, and to insure breast milk with adequate content of these elements to meet the needs of the growing child.

Macy and her co-workers found that their subjects tended to be in negative calcium balance and, to a less extent, in negative phosphorus balance throughout lactation, although their diets contained liberal quantities of calcium and phosphorus chiefly from foods such as milk, eggs and cheese, from which these elements are usually well assimilated. It was evident that the women being studied were unable to absorb or utilize calcium and phosphorus adequately while maintaining a high level of milk flow. The investigators conclude: "From these data on the nutritive performance of three women during lactation it is evident that providing an adequate diet is not the only essential; more satisfactory ways and means of inducing better digestion, absorption and assimilation of the food materials taken into the body must be devised if lactation is to leave the maternal body unimpaired."*

Macy and Huncher, in a further study of these lactating mothers, added cod liver oil and yeast to their daily diets. They found that daily feeding of 15 gm. of cod liver oil and 10 gm. of yeast

* Macy et al.²⁴⁰

over a period of two months when the milk flow was at its highest level stimulated better calcium and phosphorus utilization in all three cases. McCollum²³¹ and co-workers estimate the calcium requirement of lactating women at from 2 to 4 gm. daily and the phosphorus requirement at 25 per cent higher than calcium. The needs for extra protein, calcium and phosphorus are most efficiently met by liberal use of milk. Milk is the one single food that is of greatest value to the lactating mother. She should take not less than one quart daily.

There is some evidence that iodine and some vitamins can be increased in the mother's milk by increasing them in the food. There is no research to prove that overeating by the mother will increase the supply of milk.

Nutritional Advantages of Breast Feeding.—We have seen that if we want the best possible human milk for the infant, the mother must have the foods which supply the necessary components. As Jeans says, "Despite all our modern knowledge of infant nutrition and all the current refinements of artificial feeding, feeding at the breast of the mother remains an ideal procedure. This is true despite the fact that human milk contains only a bare minimum of most of the nutritional essentials and the fact that the body composition of the breast-fed infant departs widely from that which preceded and that which follows, in contrast to the body composition of the artificially fed baby, which maintains more closely a smooth continuance of the fetal and postinfancy curve."*

The protein requirements of infants is usually stated on the basis of the average amount received in human milk when he is making good growth progress. The amount of protein received from this source is 2 to 2.5 gm. for each kilogram of weight. Studies of the protein requirement of infants per day gave a range from 1.0 to 2.5 gm. per kilogram of weight. Translated into grams of protein per pound of the infant's weight we get from 0.45 gm. as minimum to 1.1 gm. per pound as a maximum. One ounce of cow's milk yields approximately 1 gm. of protein. Hess, planning for a margin of safety for the infant who was not being breast fed, allowed 1½ ounces of milk (approximately 1.5 gm. protein) per pound of body weight a day.¹⁶⁸ The National Research Council suggests that artificially fed infants have an allowance of 3 to 4 gm. per kilogram or approximately 1.4 to 1.8 gm. per pound from six

* Jeans¹⁸⁴ (p. 362).

months to eighteen months. Many pediatricians prescribe 3.4 gm. for each kilogram of body weight during early infancy.

Nitrogen Retention of Human Milk and of Cow's Milk.—Stearns compares the effect upon the nitrogen content of infants given larger quantities of undiluted cow's milk, treated so that it forms a fine curd in the infant's stomach, with the effect of feeding human milk. After birth the percentage of nitrogen content of infants receiving cow's milk increases in a curve continuous with the curve of prenatal content; in contrast, when mother's milk is given, a

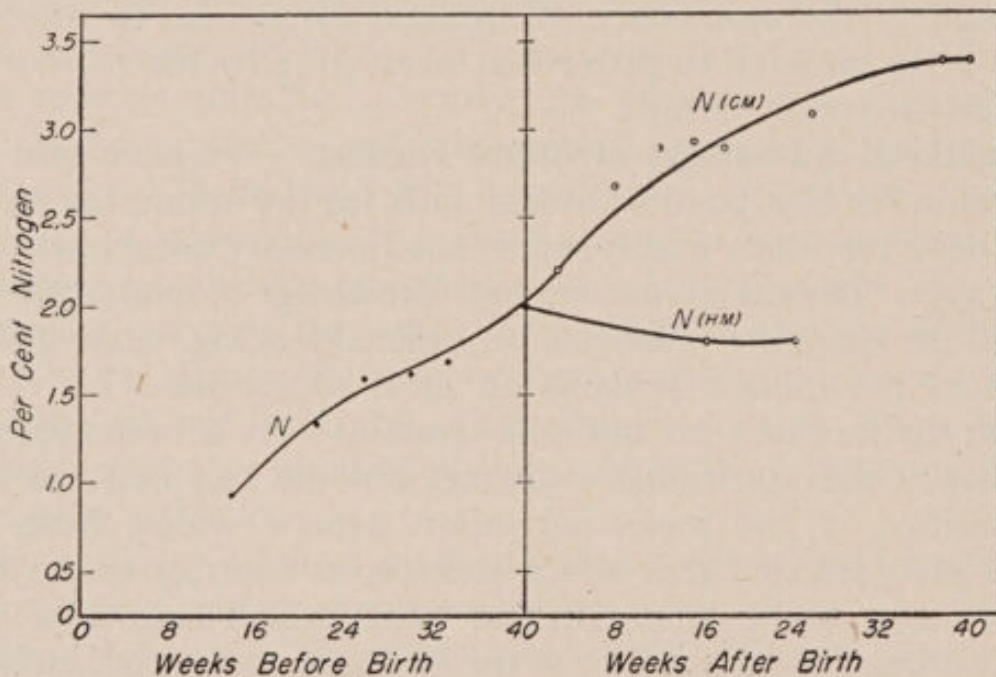


Fig. 29.—Changes in relative nitrogen content of fetus and infant. The regression line of nitrogen content of the fetus is drawn from data in the literature. *C. M.*, infants fed cow's milk; *H. M.*, infants fed human milk. (Redrawn from Stearns: *Mineral Metabolism of Normal Infants* in Jeans, P. C.: *The Feeding of Healthy Infants and Children*. In *Handbook of Nutrition. A Symposium*. Chicago, A.M.A., 1943, p. 342.)

sharp change in direction of the percentage composition occurs after birth, and for a time the proportion of nitrogen in the body stays at the birth level or decreases slightly.³⁴⁶ Greater retention of nitrogen in artificially fed infants is thought to represent larger amounts of tissue protein, since nitrogen is not stored in any other way. The larger part of the increase in tissue protein is represented in muscle. Infants who receive cow's milk in the larger of the customary amounts have approximately 25 per cent more muscle mass than infants receiving mother's milk. The muscle masses of breast-fed and artificially fed infants increase in a parallel manner

but with larger values for those having cow's milk. There seems to be no disadvantage to the breast-fed baby because of lesser amounts of muscle.¹⁸⁴

Calcium and Phosphorus Retention.—The percentage of calcium in the body differs in the infant given cow's milk from that of the one fed human milk. A decrease occurs in both types of feeding for several weeks after birth, after which period the body content of calcium in the infant receiving cow's milk starts to rise. On the other hand the body content of the infant receiving human milk continues to fall for several weeks more and probably does not reach the birth value until the infant is one year old. The calcium of human milk is used by the growing infant more efficiently than that of cow's milk, which contains three times as much calcium, but the amount retained* from cow's milk is much greater because of the larger quantity. The significance of these differences in body composition of the infant is not clear.

The growth in length of infants fed a standardized cow's milk formula is related to the amount of calcium retained.³⁴⁸ If the standardized diet was held constant and the vitamin D intake was varied, different retentions were obtained. Infants with poor calcium retention grow at average to below average rates, whereas those with higher calcium retentions grow at a rate greater than average. The breast-fed baby makes excellent growth in length even with much lower calcium retention and grows at a definitely greater rate than the infant receiving cow's milk with the same calcium retention.¹⁸⁴

The phosphorus content of the body and the phosphorus requirement depend on the amount of calcium and nitrogen retained. Human milk contains about three times as much iron as cow's milk.

Iron.—The iron stored in the body of the infant at birth is adequate to maintain the hemoglobin at a normal level for a few months, after which time additional iron is necessary. After the infant is three months of age, iron retention on the customary formula of cow's milk approximates zero; when the infant receives mother's milk, the average retention approximates 0.11 mg. A retention of 0.7 mg. is required after six months to maintain the normal hemoglobin level.³⁴⁹

* The reported value for the young infant on human milk averages 48 mg. per day while the infant under a month on cow's milk, undiluted, one with 350 to 400 vitamin D units, will retain 100 mg. daily.³⁴⁶

Vitamins.—The National Research Council has recommended 1500 units of vitamin A for the infant. This requirement is met by either human or cow's milk if it is of average content. In the first few months of the breast-fed baby's life he receives more vitamin A than the infant given a formula prepared by dilution. The early introduction of orange juice, egg yolk, green vegetables and fruit increases the vitamin A intake above the amount required so that vitamin A supplements are not necessary.¹⁸⁴

The vitamin C content of human milk varies directly with the diet of the mother, but is generally large in comparison with contents of cow's milk formula. Human milk in this country will normally contain 60 mg. of ascorbic acid (vitamin C) to the quart;³²¹ a cow's milk formula prepared by boiling and diluting may contain 6 mg. or less.¹⁶³ Human milk will meet the recommended requirement, but the cow's milk formula falls far short of it. This deficiency is made good by giving orange juice. Although human milk seems to be adequate for the breast-fed infant, there can be no possible disadvantage in having orange juice.

Thiamine content of human milk varies widely and depends on the diet of the mother.²⁵² Cow's milk, though subjected to heat, contains more thiamine than human milk. The allowance of 0.4 mg. of thiamine for infants recommended by the National Research Council can hardly be attained by use of the average human milk or average cow's milk formula. The fat in mother's milk appears to have a sparing action on thiamine so that human milk more nearly meets the infant's requirement than the average formula. Using either of the milks, it is highly desirable to supplement the infant's diet with foods high in thiamine at an early age.¹⁸⁴

The riboflavin content of human milk varies widely, and the cow's milk varies less; both are affected by the intake. The average riboflavin content of cow's milk is five times that of human milk. The recommended allowance for infants is 0.6 mg. and is met by cow's milk but probably only occasionally reached by human milk. However, applying the same kind of reasoning as was used for thiamine, it would appear that the average breast-fed infant probably is adequately supplied with riboflavin.¹⁸⁴

Both cow's and human milk are poor sources of niacin, human milk being probably the poorer of the two, and neither more than barely meets the requirement of the infant.¹⁸⁴ Neither human nor cow's milk contains significant amounts of vitamin D, thus the

requirement of the infant must be met by some supplement since it is essential in the efficient utilization of calcium and phosphorus.

The structure of the child's body and the functioning of the various systems as well as their interrelation has been discussed (Ch. IV); also the rapidity of his growth and development during the early years of his childhood and especially in infancy, and the chemical changes that take place in food in order that it may be absorbed and utilized by the child's body have been presented. The consideration of what to feed the child in order to meet the needs of all of the tissues of his body and to provide for his optimal growth will be discussed later (p. 219 ff).

Other Advantages of Breast Feeding.—The diet of the infant and child is of such vital importance to his growth and development that it should be under the supervision of a physician. For the normal full-term infant of a healthy mother, breast feeding is almost always the method of choice. The quality and quantity of human milk are greatly influenced by the nutrition and general hygiene of the mother. These factors have been discussed above, but it should be added that only as good nutrition is observed by the mother can she be sure that breast milk is a nutritionally better food for the infant than cow's milk. When, however, the mother's diet is really adequate, and her milk correspondingly so, breast feeding in addition to nutritional advantages has a number of other distinct advantages over artificial feeding. Breast milk is more easily digested, and, both for this reason and because it passes directly from producer to consumer, there is less possibility of bacterial contamination and breast-fed infants have fewer gastro-intestinal upsets than artificially fed infants. The breast-fed infant has relatively fewer infections and much greater resistance to infection than the artificially fed infant. Indeed, Grulee and coworkers,* in a study of 20,061 infants from birth to nine months, found that only 37.4 per cent of the breast-fed group had any illnesses during the period of study, while 53.8 per cent of the partially breast-fed group and 63.6 per cent of the artificially fed group had illnesses. Of the total mortality among the entire group (1.1 per cent), 6.7 per cent was in the breast-fed group, 27.2 per cent in partially breast-fed group and 66.1 per cent in the artificially fed group. In other words, the morbidity rate was almost

* Grulee, C. G., Sanford, H. N., and Herron, P. H.: *Breast and Artificial Feeding*. *J.A.M.A.*, 103:738 (Sept. 8), 1934.

twice as great in the artificially fed as in the breast-fed infants and the mortality rate almost ten times as high. This is the strongest argument in favor of breast over artificial feeding. It is of such importance that any woman who really accepts her role as mother will want to give her baby this protection. Another advantage, if the mother herself is caring for her baby, is that breast feeding is distinctly easier. No time is spent in preparing the formula, sterilizing bottles, nipples, and other utensils, warming the formula to correct temperature and cleaning bottles and nipples afterward. In many households the refrigeration of the formula is a real problem. Breast milk is automatically prepared, is the right temperature for the baby and the only time spent is that in actual nursing, which must be spent in any case.

As a phase or part of the infant's basic need for a feeling of bodily comfort or well-being is his need for close physical contact with another individual. Any one who has ever had the pleasure of holding a young baby knows how responsive he is to cuddling, how he snuggles against the person holding him with obviously pleasurable reactions. This close physical contact can be better accomplished by breast feeding than by bottle feeding.

"It is the close physical association that matters most. The mother can most naturally establish this by breast feeding, and so meeting her baby's first instinctive need; and we do not think a woman who takes her function of motherhood seriously should refuse this first demand her child makes upon her. We also believe that if a baby is fed successfully on the breast its physical well-being will be conducive to sounder psychological well-being, but further than this in the direction of psychological argument, we are not prepared to go."*

The close physical contact of child with mother while feeding at the breast is, then, an important means of fulfilling the infant's deep need for affectional security, which is discussed in Chapter X. There are other psychological advantages of breast feeding which benefit the child less directly than through the direct physical contact. The mother who satisfies her suckling infant from her own breast experiences a deep contentment in the complete fulfillment of her role as mother; her ego is expanded by her sheer physical ability to produce food for her hungry young; and her confidence in herself as a mother is increased accordingly so that

* Report of Advisory Committee on Mothers and Young Children on "The Breast Feeding of Infants." Reports on Pub. H. and Med. Subjects, No. 91, Ministry of Health, London, Published by His Majesty's Stationery Office, 1944, p. 10.

she is relaxed, confident, efficient and, consequently, more effective in her other relations with and care of her child.

Feeding Regimen.—*The Self-Demand Schedule.*—The feeding regimen, whether the food be human milk or a formula of cow's milk, is probably of even more far reaching psychological importance to the infant than any importance which can at present be attached to breast feeding in itself. The normal full-term, newborn infant has well-developed reflex capacity to suckle and to swallow. It is known that he has hunger contractions when his stomach is empty, and that these contractions cause him discomfort. When the contractions occur, he awakes from sleep suddenly and cries lustily. As soon as some liquid reaches his stomach, he ceases to cry and begins to relax as if relieved. This reflex cry, then, is nature's design for the protection and survival of the infant, and is his only early means of announcing his lack of physical well-being and comfort. If our goal is to foster independence in the child, it is logical to respect his rhythm and provide food as he demands it. Thus we not only nourish his body, but we also promote his psychological well-being by satisfying his expressed needs and helping him, through gratification of these and exercise of his early reflex abilities, to build up pleasant conditioning toward food and the process of eating. This is important preparation for the time when eating becomes a more complex, voluntary act under conscious control. "It is back here in the comparatively simple performance of the earliest days of life, that the child begins to develop the positive conditioning and the sense of competency which we recognize as so important for the later success of the individual."*

It is the practice of an ever-increasing number of pediatricians to instruct mothers to feed their newborn infants when the infants demand food, and to feed them as long and as much as they demand. If the baby is breast-fed he is put to the breast each time he gives evidence that he is hungry and, after the first few days, allowed to nurse as long as he pleases. Under this regimen breast-feeding has another distinct advantage over artificial feeding in that demand, to a large degree, regulates supply, and the infant takes what he wants or needs, perhaps an ounce, often three to five ounces, and occasionally ten or twelve ounces. If he is formula-fed the mother soon learns, of course, what is an average amount, but if she warms this amount, say 5 ounces, and the infant takes

* Aldrich⁵ (p. 579).

only 2, 3 ounces are wasted. If, on the other hand, the infant is particularly hungry and demands 8 or 10 ounces, the mother must stop in the middle of the feeding to warm a second bottle of formula.

Since the newborn infant operates largely on a reflex basis for about the first three months of life, and since his reflex cry registers protest against many other discomforts beside hunger, it becomes important to use a good deal of judgment and common sense in determining when the cry does indicate hunger. The mother must be given some guides. It is known that the stomach ordinarily takes two or more hours to empty itself of food. Thus when the baby who has just recently been fed cries, it seems reasonable to suspect that some other cause than hunger is operative. One investigates in any case, but particularly in this circumstance, to see whether or not the baby is wet, soiled, cold, too warm, in need of fondling and so forth. In a recent investigation conducted by Dr. Aldrich and others at Rochester, Minnesota, of causes of crying in a newborn infants' nursery, the cause of crying was ascribed to hunger when it occurred near feeding time and was accompanied by sucking movements. When the baby was wet, or soiled or had just vomited, crying, when it occurred, was ascribed to these causes. For fifty babies observed for twenty-four hours over an eight-day period, crying was ascribed to hunger in 2760 incidences or in 35.5 per cent of the total crying time. An even larger number of incidences, 3295 (35.1 per cent of the crying time) was ascribed to unknown causes. Dr. Aldrich and his co-workers suggest that a complete list of causes of crying should include the need for fondling and rhythmic motion. They concluded that the large number of unknown causes of crying needs further attention. This, they say, "will . . . mean individualization of the management of each baby, and the provision of closer contact with nurse or mother during the neonatal period."*

The hunger cry is usually quite insistent and is not assuaged by other means than by food. The cry of colic, which occurs quite frequently in babies under three months of age, is also an insistent cry, but it is more apt to occur soon after feeding than near feeding time. Dr. Eugene Roseman is credited with having pointed out that the baby who cries with his head thrown back does not have the colic but is hungry, while the child with colic cries with head pulled forward, knees drawn up and arms across the chest.⁹

* Aldrich⁷ (p. 96).

Mothers who have successfully fed their babies on a self-demand regimen in which the baby decides when he is to be fed, declare that it is relatively easy to learn to understand when the infant is in need of food and when in need of some other attention.

In Chapter III we mentioned the desirability of having babies in hospital rooms with their mothers. When this is possible the mother has opportunity to learn to know her baby from the very beginning and is not faced at the end of eight or ten days with the necessity of taking home a comparative stranger, with whom she must become acquainted at the same time she is making innumerable other adjustments which she meets when she leaves the sheltered environment of the hospital. Making the acquaintance of her baby during the hospital period has the additional advantage of allowing her to assume responsibility gradually while both the doctor and the nurse are available to answer questions and share responsibility. Ideally, too, the self-demand program is put into operation at once, and this is most readily and successfully managed if the mother and infant are in the same room.

If this regimen is begun in the hospital period, it is usually pursued as follows: Six to twelve hours after delivery, as soon as the mother has had a good, restful sleep and the infant is awake he is put to breast for two to five minutes. Thereafter the baby is put to breast whenever he is awake and gives evidence through rooting, sucking or crying that he is hungry. The physician may limit the time allowed at the breast at each nursing to five to ten minutes during the first few days in order to allow the mother time to become adjusted to the pulling on her nipples and thus to help prevent sore nipples. At first this short interval seems to satisfy the infant in any case.

Because most hospitals feel that their nursing staffs are too limited to allow self-scheduling under the present arrangement of separate nurseries for newborn infants, few records are available of the feeding behavior of infants fed during the first two weeks according to their own rhythms. One mother and her pediatrician have reported the records of two infants, however, who were fed on demand from birth. These records show that each of these babies nursed very frequently during the first two weeks, sometimes as often as eleven times in twenty-four hours. By the third week Baby H. nursed on the average of eight times in twenty-four hours while Baby J., the older child, by this age nursed only six

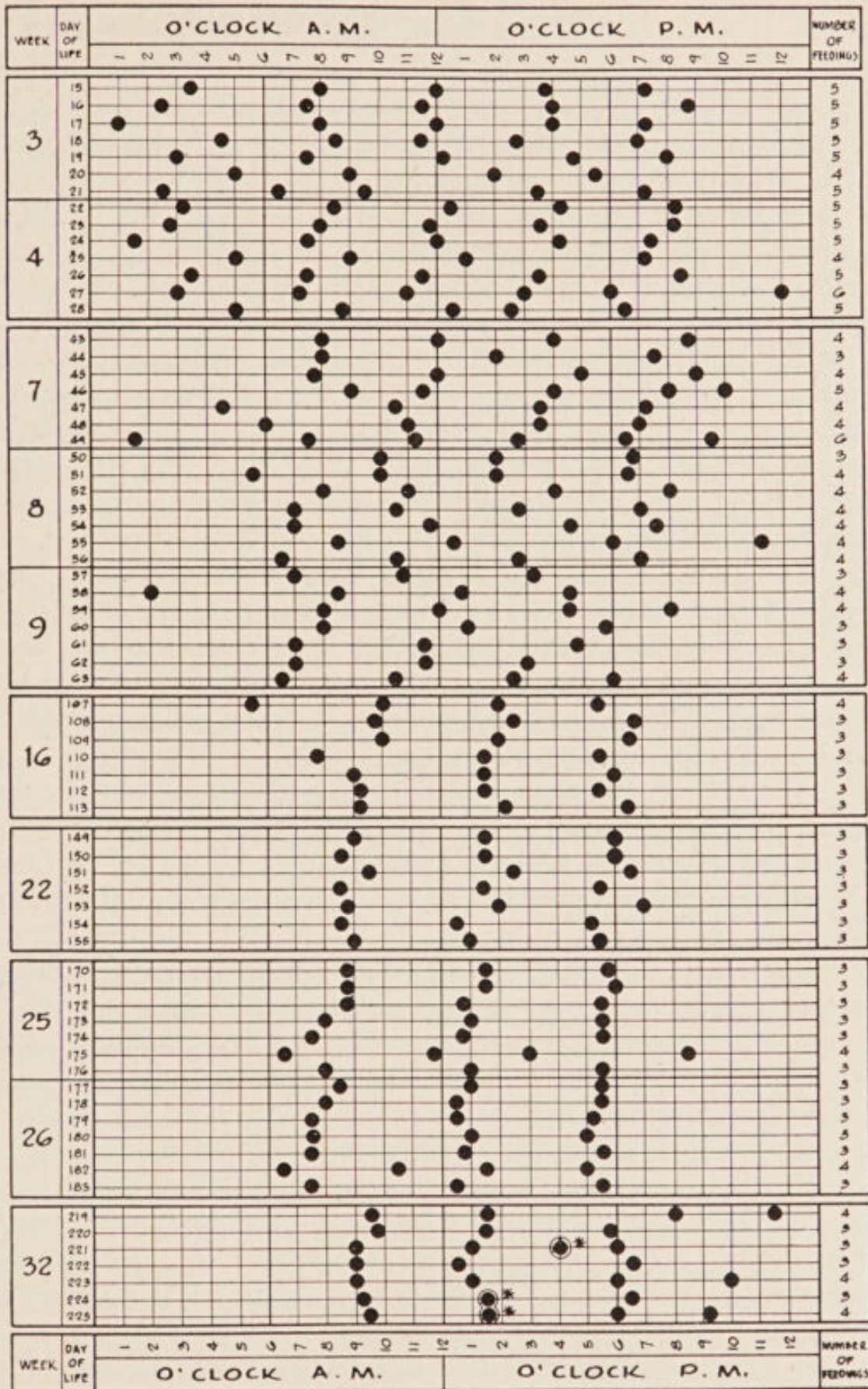


Fig. 31.—Chart showing the feeding of the male twin. Cup feeding, on 221st day, given not in response to demand for food but as an educational device to accustom infant to drink milk from a cup. (Trainham, et. al: The Journal of Pediatrics, Vol. 27, 1945, C. V. Mosby Company.)

times in twenty-four hours. By the tenth week each of these babies was quite well stabilized on five feedings daily.³²⁹

In our files we have no records of the feeding behavior of infants started at birth on such a regimen. We do, however, have a number of such records beginning after discharge from the hospital. Figures 30 and 31 show graphically how rapidly two of these babies, fraternal twins, put themselves on a quite regular schedule when they were fed according to their own demands. It will also be seen from these charts that these babies reduced the total number of feedings much more rapidly than the babies referred to above. Indeed, the female twin demanded only four feedings on four of seven days as early as the third week. By the eighth week she was quite well stabilized on the four-feeding day and by the ninth week began frequently to demand only three feedings daily. Her twin brother in the ninth week demanded only three feedings four days out of seven. This has been the experience with most of our babies, that when left to their own demands they reduced the total number of daily feedings more rapidly than has usually been customary when babies were fed on a strict schedule with a prescribed number of feedings.

For the normal, full-term healthy infant of a thoughtful, intelligent mother, this method of infant feeding seems to be practically 100 per cent successful, and is equally popular among the mothers and families who have used it. For the premature infant, the infant with some abnormality of the gastro-intestinal tract, and certain other abnormal cases, the method will obviously be inappropriate. The premature, for example, will not be sufficiently mature to assume this degree of independence. For the less intelligent, less self-confident mother of a normal baby some modification may be necessary. She may need more explicit instruction and perhaps some definite time range within which she will feed the baby if he wakes. In any case, as we stressed at the beginning of this discussion, the feeding of the young infant should be under the supervision of the skilled physician, and it becomes his responsibility to determine what feeding regimen is appropriate for the particular mother and child.

Some Questions Related to Self-Demand Feeding.—When mothers or students who are accustomed only to the old scheduled regimen in which babies were fed at definitely prescribed intervals are first told of this plan of infant feeding, several questions immediately arise. First, must the mother be constantly at home

twenty-four hours of every day? This certainly would be most undesirable, for, by all means, she needs fresh air and exercise as well as recreation, and should be allowed to leave some one with her baby while she is out, frequently for brief intervals and occasionally for longer intervals. This is most important both for her physical well-being and her mental hygiene. By the fifth or sixth week or by the time the mother herself is ready to be out for any appreciable length of time, most babies will have put themselves on fairly regular schedules for the twenty-four-hour period and by this time will have even more consistent feeding intervals during any given day, so that it is quite possible for the mother to plan blocks of time away from home without missing any feedings. It is also quite permissible for the mother occasionally to leave a formula for the attendant to give to the baby from a nursing bottle. Indeed, it is desirable as an educational procedure to give the baby an occasional artificial feeding so that neither the feeding nor the utensil is strange to him if some emergency arises which makes it impossible for his mother to nurse him for several days.

The second question which arises is whether or not a baby is not spoiled by such prompt and consistent adherence to his demands. As Horace Mann has said, "Above all others must the children of a republic be fitted for society as well as for themselves." This kind of feeding regimen may serve to fit children for themselves, we are told, but they have to learn to fit into a society which requires them to conform as well as to assert themselves. Isn't this going to teach only assertion, we are asked. On the contrary, the prompt gratification of elemental basic needs, such as the need for food as a part of the broader, more comprehensive need for a feeling of physical well-being and comfort, contributes instead, not only to this feeling of physical well-being which in turn contributes immeasurably to a relaxed, happy disposition, but also to a sense of security. Such gratification fosters "a confidence in the lawfulness of the universe."* These things constitute the corner-stone which supports the superstructure of socialization, including conformity. During the early months of reflex control, one is not in danger of spoiling the baby by too frequent and too prompt gratification of basic needs, the result of which is a conditioning to pleasurable associations with persons, with food and other things. Rather, one is in danger of spoiling the child by too limited gratification or by thwarting the satisfaction

* Gessell and Ilg¹³⁶ (p. 56).

of basic needs and thus conditioning him unpleasantly toward food or equally basic needs. Later, of course, as the organization of the individual becomes more complex, and more functions come under conscious control, and *wants* and *interests* are added to *needs*, the wise parent or other worker with children must seek a judicious balance which allows prompt gratification of real needs and reasonable desires, and at the same time, with equal firmness and promptness, denies unreasonable and dangerous wants. Thus there is begun the balance between love and discipline which is discussed in Chapter X. If learning is to be promoted at an optimal rate during infancy there must always be an overbalance of gratification and a minimum of frustration. Wisdom and imagination are required to set up such an environment, both physical and psychological. Let us look, for example, at the twenty-one-month-old child whose curiosity is insatiable, whose verbalization is limited, whose height does not permit him to see what is on top of table or chest without either climbing on some other furniture or pulling off the cover to get at what is on it, whose motor power is great enough to pull out table and dresser drawers but not always controlled enough to keep them and their contents from spilling on the floor. One does not have to provide frustrations for such a child; they are frequent and inevitable. One's role with a child of this age should be to limit frustrations and multiply judicious gratifications. If this is done, a high degree of security, self-dependence and conformity is observed in the developing child.

As Commander Spock, in discussing the pediatrician's responsibility for instructing the new mother, explains it: . . . "the schedule should be presented as part of a flexible natural program of adjusting to the baby's needs, capacity, and digestive rhythm. A new mother needs to be reassured that her child, through the unfolding of his own inherent, human, developmental pattern will gravitate toward healthy, socially acceptable habits of eating, sleeping, eliminating, and getting along considerately with people; that she doesn't have to, but in fact will do better not to, institute any grim 'training' program either in the beginning or later on."*

Sleep an Important Factor in Bodily Comfort and Well-Being.—Sleep is a positive function of the body. It is not a cessation of bodily activity but a readjustment of the whole machinery of the body, including the central nervous system, to protect the total

* Spock³⁴⁰ (p. 230).

welfare of the organism. "Sleep is behavior, . . ." and "Perfect sleep is a total response. In this sense sleep differs from other forms of behavior. All other behavior represents an adjustment or an adaptation to more or less specific situations. Sleep, however, is a totalitarian response which is as inclusive and fundamental as nutrition. Indeed it can be envisaged as an expression of nutritional economy."*

The child has to learn to sleep in the same way he learns to crawl, to stand, to hold a spoon and to feed himself. Just as crawling precedes walking and is a stage in his development, so the patterns of sleep change as the child matures. "Perfect sleep must, then, be defined as a form of positive inhibition which embraces the entire organism and which serves best to protect its developmental needs."* The early association between feeding and sleeping is extremely close. The baby is fed, sleeps, wakes when he is hungry, is fed and goes back to sleep, so that the two functions almost overlap. The newborn knows how to nurse. Having "learned" how to sleep, he must learn how to wake and to keep awake. He wakes up much of the time because he is hungry. Kleitman²⁰¹ has shown that such awakening requires no special mechanism other than stimulation of the subcortical wakefulness center. As the child "learns" to stay awake the higher nerve centers of the brain (the cortex) become involved, and cortical nerve cells make connection with his eyes, ears and the muscles used in staring and looking.

Maturity Stages of Sleep.—There are, as recorded by Gesell and Ilg,¹³⁶ three distinct phases to the sleep cycle: going to sleep, staying asleep and awakening. The first depends on a higher cortical control which enables the child to release into sleep; the third upon an active wakefulness nerve center. As these brain centers mature, association becomes more and more involved and the integration of sleep with the rest of active life becomes more and more apparent. The task of development is to bring about a balance between release into sleep, consolidation and awakening. As the child grows and matures the phases of sleep change; he wakes more smoothly, learns to stay asleep but releases into sleep less easily. The "learning" process follows a maturation pattern for sleep. At birth sleep is interrupted by internal stimuli from the gastro-intestinal tract or some other internal source; there are brief periods of exercise and the child drops back into sleep. Later

* Gesell and Ilg¹³⁶ (pp. 298-300).

there are periods of wakefulness, and the sleep is shortened as the child begins to recognize that he can choose to remain awake. Then the child begins to play, using hands and feet; he becomes interested in his own body and in sounds. When the child is no longer fed during the night, this period of sleep is uninterrupted. Next he sits up, takes an interest in his environment and begins to reach for toys; the period of being awake lengthens. Then he takes only two naps, one after his bath and exercise, and one other; there are longer periods of wakefulness between. When only one nap is taken, the child is awake most of the day. This occurs in many children before two years of age, and in most children by four years of age. Finally, release into sleep becomes voluntary, and there is voluntary inhibition of the wakefulness centers. Most five-year-olds have reached this stage.

By sixteen weeks the child's waking mechanism is operating with comparative efficiency. At two and one-half years he has some difficulty in going to sleep and some difficulty in waking. The difficulties seem to be related to each other at this highly unsettled stage of maturity. The reduction in the number of naps from four to five in twenty-four hours at three months, to one at four years is not merely a reduction of the number of hours, but, according to Gesell,¹³⁶ involves complex pattern transformations, adjustments to the schedule of the entire behavior day and readjustments to the ever-changing interest and abilities of the growing child. It is generally recognized that when changes in other phases of growth are most active, the sleep of children is most liable to be disturbed.

Individual Differences in Sleep.—Sleep may vary greatly in depth, in scope and integratedness among children. Some children are good sleepers; some are poor sleepers. In the early months of life the changes in the gastro-intestinal tract may disturb the child; later it may be wetness or some bodily disorder; still later it may be some change in his environment, some fear or some undue excitement. These are things that happen to all children but if the child has a firm hold on sleep, he is little disturbed by them. If he cannot hold fast to the sleep which he acquires and does not consolidate his gains easily, the disturbances normal to children become intensified in degree and extended in time. As a rule, poor sleepers do not pass easily from one stage of maturity to the next.

Washburn and Putnam³⁸⁶ found that infants varied as much as adults in extent and quality of sleep. Usually, infants who slept

less than others took less sleep as they grew older. Reynolds²⁹¹ reports that the amount of sleep taken by a preschool child varies considerably from day to day, but there is a fairly constant average over several weeks' time. There is no consistency in the variations of different children, and at no time did her group of seventy-seven children between the ages of one and one-half and six years behave like a unit in the periodic changes in the duration of sleep.

Nap.—The average duration of the nap of nursery school children is given by Chant and Blatz⁷³ as sixty-five minutes. In their opinion, the afternoon nap reinforced the night sleep in the early years but later interfered with it. Scott,³¹⁸ studying twenty-nine children of preschool age, found the average duration of the afternoon nap to be seventy-four minutes, but thirty-eight minutes elapsed before the children fell asleep. During the second year the total amount of sleep fluctuates between thirteen and fourteen hours, made up of eleven to twelve hours night period and a two-hour nap. From this age until the child begins to attend school, his night sleep period remains unchanged, and the nap gradually decreases to one hour. Then it is given up. Foster¹¹⁷ shows the decrease in the amount of sleep from thirteen to fourteen hours in the second year, to twelve at the end of the fifth year, is due mainly to the shortening and later to the abandonment of the afternoon nap, as evidenced by records kept by mothers of 1000 children less than eight years old.

Dales,⁸⁶ in a study of afternoon sleep of seventy-three children of preschool age at the Merrill-Palmer School, embracing a three-year period, found that with an increase in age the duration of afternoon sleep decreased, and the duration of the period of "pre-sleep" increased; that seasonal differences in afternoon sleep and pre-sleep were negligible; that the number of children sleeping in the room was not an influencing factor in the sleep of the children. Her study showed that there were wide individual differences in the duration of the afternoon sleep and pre-sleep of children between two and five years. Staples and Anderson³⁴⁴ found no relation between the length of the afternoon nap and the time it took preschool children to fall asleep in the evening, although in some children, especially older ones, such a relationship exists.

There is no general rule about the total amount of sleep in twenty-four hours for the individual child, since children vary widely in their needs and at different stages of their development. However, it is highly desirable that the growing child have ade-

quate sleep and, when he is at the ages covered by this text, a nap or a quiet rest period.

Activity in Sleep.—When they sleep, children move their bodies occasionally. Garvey,¹²⁷ studying motility during night sleep, found that among his group of children from two to five years of age children moved on the average once every seven and one-half minutes. He observed that although they move more frequently than adults, children remain still for an hour or more at a time. Adults seldom remain quiet for such a time. Boynton and Goodenough,⁴⁸ observing children at nap time, found in a group of fifty-six nursery school children an average of one change of posture in twenty-five minutes.

Many of the studies indicate that activity just before retiring or fairy tales disturbed the sleep of some children. Putting a child who was accustomed to sleeping alone in a room with another child increased activity during sleep. Eating a large amount of food at the evening meal markedly increased motility, but hot or cold baths had no effect. Fear, worry, disappointment or pleasant anticipation interfered with quiet sleep.

Sleep Regimen.—Since control of sleep, like the control of eating, involves a complex process dependent upon cortical control, it is imperative that the child be given opportunity to learn to manage this function which is so basic to his well-being. This, like feeding, can be learned on a self-demand basis. "Knowing so little about the mechanisms of sleep, we ought to pay more respect to the physiological self-demands for sleep, not only in infancy, but in early childhood. Half, and over half, of every behavior day is expended in sleep during the early years. It is important that science should further our insight into the determinations and modifiability of this engrossing, powerful function, which is so pervasively identified with the growth complex, with the organization of personality, and the conventions of culture."*

When a child is on a self-demand feeding regimen, he is usually also on a self-demand sleeping regimen. If he is, he will be allowed to sleep until his own physiological need, usually hunger, wakens him. With little regulation from the adult, most children soon settle into a regimen which includes more sleep at night than in the daytime. As some regularity develops in the routine of eating and sleeping, the mother can predict a suitable time for the bath and for play periods and can plan her own household schedule

* Gesell and Ilg¹³⁶ (p. 310).

accordingly. As the child grows older, there may be some conflict between physiologic need for sleep and the child's intellectual and social interest in his environment. By this time, however, observant parents are alert to the premonitory signs of fatigue. Without undue strictness of management they can help the child to give up his play and prepare for sleep before his need becomes too acute.

Physical Environment Important to Sleep.—The sleep of the newborn infant seems little affected by sound in his environment. Indeed, the recent research conducted by Dr. Aldrich in a newborn infants' nursery suggests that crying is not contagious from one baby to another as we have long supposed. "From these observations and analysis, perhaps it can be safely inferred that there is about a 50 per cent chance that when an observer walks into a nursery he will hear not more than 10 per cent of the total number of babies in the nursery crying, if there is any crying at all at that moment. The chance would be perhaps less than 0.14 per cent that he would find 50 per cent...crying simultaneously at one instant. It seems unlikely, therefore, that crying is contagious from one baby to another, in spite of the fact that their hearing is acute."*

During the periods of rapid growth, when sleep patterns are most likely to reflect the disequilibrium of the organism, the external environment may need greater scrutiny. A cool, quiet, dark room, a comfortable bed with light-weight covers, helpful factors in promoting sound sleep at any time, become even more important at such periods in the child's growth. While there is ordinarily no need to curtail usual household noises, loud, penetrating noises should be eliminated from the child's sleep environment at any time. During periods of rapid growth changes, this soft-pedaling of such sounds takes on added importance.

Psychological Environment also Important.—The emotional climate of the home is of utmost importance in the promotion of good sleep habits just as it is a major factor in the establishment of good eating habits. The child who goes to bed after a happy day, secure in the affection of his parents, is much more likely to sleep than the child who approaches sleep with some emotional disturbance. Conflicts should be avoided just before bedtime as well as just before or during mealtime. Similarly, too active and therefore too stimulating play just before bedtime is unwise.

Thumbsucking: A Common Means of Fulfilling Needs.—So large a proportion of infants suck their thumbs at some time dur-

* Aldrich, Sung and Knop⁷ (p. 323).

ing infancy that thumbsucking becomes a problem of importance in the minds of many parents. There are numerous theories to explain why the habit is so usual among infants. One group of physicians and psychologists explain it as due entirely to *inadequate feeding*: the amount of food is too little or too great, the quality is unsatisfactory, the intervals between feeding are too long or too short. If this is the case the correction of thumbsucking lies in changing the feeding schedule or the food or both. The physician is the person to determine when and how this should be done. Babies on self-demand schedules tend to suck their thumbs much less than do babies on rigidly prescribed schedules.

Another group of specialists claim that the habit is due to *inadequate satisfaction of the sucking impulse*. Milk flows too freely from the mother's breast or the bottle and the child's hunger is satisfied before he has sucked vigorously enough or long enough to satisfy the sucking impulse. The corrective in this case is to leave him at the breast longer or to provide adequate sucking in some other way.

One school of psychologists claims that thumbsucking is due to an *unsatisfied craving for affection*, or to other unsatisfied emotional urges. This factor as a cause of thumbsucking and other such habits has been emphasized by psychoanalysts.

Another group of investigators explains it as a *chance habit* established when the baby's fist comes by chance into contact with his lips with a resulting *instinctive* sucking and satisfaction. There are still other explanations offered. No doubt each theory explains some of the cases; probably no one theory explains all of the cases.

Gesell's discussion of thumbsucking may serve to summarize and clarify the situation. He seems to feel that thumbsucking is often related to the control of feeding and of sleep. It has its onset most often between eight and twelve weeks of life although it may appear any time during the first year. When the onset is most closely tied to feeding, the habit is not likely to last long.

When, however, it is connected with sleeping it is likely to continue longer and to become more closely tied to the sleeping function, as time goes on. It tends to recede at certain periods such as the twenty-eight-weeks period when the mouthing of objects may take its place. Sometimes it may come to a sharp termination, as though some developmental hurdle had been passed. This suggests the relatedness to the thumbsucking of certain personality and growth factors. When the habit lasts beyond the first birthday, it

is likely to be slow to disappear, sometimes goes on into the third and even the fifth year. When it does this, it is "related not only to sleep and hunger, but becomes a generalized tension outlet, utilized for escape and relaxation in situations of fatigue, embarrassment, frustration, fear, and also excitement."*

Gesell goes on to say that thumbsucking reaches its highest peak between eighteen and twenty-one months when some children appear to suck their thumbs even in preference to play with toys or other children. Between two and three years of age, however, the pattern begins to break, and the child busies himself more with active play, reserving the thumbsucking for periods of fatigue or quiet. It not only induces sleep at this stage, but usually accompanies sleep to some extent. By three years of age it has faded sufficiently that its chief association seems again, as it had in the first year, to be mainly with hunger and sleepiness. The three-year-old "tolerated removal of thumb after he has fallen to sleep (not so the two-year-old), but he sucks again when he wakes. At four years, the sucking occurs only prior to sleep: it does not invade the domain of sleep at all. A mere minute or two with the thumb suffices. The five-year-old is able to verbalize the situation and cooperates with his parents in any plan of action."†

What Should Be Done About Thumbsucking.—In the early days of "child training" most writers regarded thumbsucking as an undesirable habit to be ruthlessly weeded out by an aggressive campaign of action. Few points of view in the field of child development have suffered so radical a change in the past ten years as this one.

As the deeper meanings of the child's emotional and behavioral development have come to be understood, it has become increasingly clear that aggressive attacks upon such behavior as thumbsucking, masturbation, nailbiting, stuttering and other such manifestations is not only largely futile, but it actually is dangerous to the future emotional development and personality adjustment of the child. The older recommendations for the use of mechanical restraints, of rewards and punishments and other adult imposed devices are now considered not only poor practice, but in all probability risky to the future well-being of the child. As we have come to understand that such behavior is closely associated with the total developmental picture, and that it often symbolizes some deep developmental need of the child, we have come

* Gesell and Ilg¹³⁷ (p. 306).

† Ibid. (p. 307).

to change our attitude toward it and to revolutionize our treatment of it. There is accumulating evidence that when the physical and emotional needs of children are met adequately, any behavior manifestations which appear on the way will adjust themselves to the total growth complex and will disappear spontaneously in due time.^{123, 136, 292, 389}

There is one situation which will impede this spontaneous adjustment. In any form of behavior, such as thumbsucking, masturbation, stuttering and the like, if the parent becomes tense and anxious, or if severe discipline or persistent nagging occurs, the behavior pattern tends to become fixed so that when the time comes for the growth pattern to straighten itself out it cannot be done. Wrong treatment arouses such emotional reaction that spontaneous readjustment of the behavior becomes impossible. Many children show this emotional reaction clearly by negativism, defiant resistance or by sneaking under cover with the behavior. These cases are clear, and easily tell adults when their treatment of these children is not only futile, but perhaps dangerous. The child who passively responded to a campaign of aggressive discipline by correcting the habit misled us into thinking that "discipline" methods worked. Later, however, it was learned that among these apparently "corrected cases" a high percentage broke one "bad habit" only to appear soon with another, or having repressed the emotional reaction which was expressing itself in the original behavior, later exploded into neurotic or other difficult behavior. It has been these reappearances of undesirable behavior or later explosions which have convinced child-development workers that the use of mechanical or of psychological force is no more constructive in handling children than it is in governing nations.

The present attitude toward thumbsucking is to consider it as fulfilling some basic need in the child's life. When it first appears, some shift in time, amount or quality of feeding often corrects it, or some adjustment in sleeping hours or situation may cause it to disappear. Plenty of love and affection properly balanced by a gradually increasing adjustment of the child to a workable routine for him and his family are, as we shall see later, important ingredients in a child's life. It is the provision for the child's basic growth needs rather than a direct attack upon the habit itself which is now the generally accepted method of meeting the situation.

The Care and Feeding of the Growing Child

(CONTINUED)

MEETING THE CHILD'S INCREASING NUTRITIONAL NEEDS

Nutritional Needs of Infant.—In the first year of his life the child will pass through one of his most dramatic periods of growth, and it is possible in this period to observe how perfectly the pattern of his nutritive maturation is synchronized with his physical development. In order to grow an inch a month during the first year and to double his weight in the first six months, he must have not only a sufficient quantity of food, but it must provide all the amino acids that are nutritively essential (see p. 92), and the vitamins and the minerals necessary for optimum growth and health.

Need for Vitamin D.—Nature met his first great need with mother's milk, but neither mother's nor cow's milk is adequate in the vitamin essential for the laying down of the minerals, calcium and phosphorus contained in the milk, as bone. To meet his second nutritional need vitamin D must be added to his food. Fish liver oils are the food richest in vitamin D. Cow's milk has been fortified with vitamin D, either by irradiation or by the adding of concentrates. The breast-fed child will have to receive his vitamin D in a fish liver oil, such as cod liver or halibut liver oil. Two questions usually arise. How early in life can a child be given fish liver oils, and how much does he need? Jeans* says that fish liver oils in appropriate amounts may be expected to produce no digestive difficulties at one or two weeks of age. The requirement for vitamin D has been set at 400 units by the Food and Drug Administration; at 400 to 800 units by the Food and Nutrition Board of the National Research Council; 2 teaspoons of minimum standard cod liver oil (about 600 units) is the daily amount recommended by the Council on Pharmacy and Chemistry of the Amer-

* Jeans¹⁸⁴ (p. 352).

can Medical Association. The investigations of Jeans and Stearns show that the needs of the normal infant for optimum or maximum calcium utilization are met by 350 units of vitamin D of no greater concentration than that which exists in cod liver oil.

Need for Vitamin C.—Next to the need for vitamin D comes that of vitamin C, because shortly after birth the blood level of ascorbic acid in infants begins to fall and by the tenth day the artificially fed baby may have only about 0.4 mg. per 100 cc. of blood (considered the prescorbutic level); the breast-fed baby may be receiving appreciable amounts by the fifth day, provided that his mother's diet is adequate in this constituent. If the child's diet of milk does not supply sufficient quantities of vitamin C, it must be added since it influences the total growth of the body, the character of the bones, the dentine of the teeth and the formation of the intercellular substances which are a part of cartilage. The young artificially fed infant has been found to need 20 mg. of ascorbic acid in addition to the small amount in the formula. An ounce of orange juice is desirable beginning early in infancy, and by the time the infant is three months old the amount can be increased to two ounces or more.¹⁸⁴ Tomato juice and ascorbic acid tablets are also used as sources of vitamin C.

Need for Increased Amounts of Vitamins and Minerals.—By the time the young child is three months old his reserve supply of iron, normally present at birth, may be exhausted. Milk, supplemented by fish liver oils and orange juice, no longer meets his requirement for iron, vitamin A, thiamine, riboflavin, and niacin. He has now become much more active, and foods must be added to supply the increased energy demanded. He begins to drool at about this age which indicates his salivary glands are maturing and his digestive tract, because of the starch-splitting enzyme present, can handle carbohydrates of a more complex composition than milk sugar (lactose). His body has grown in length and increased in weight, and his digestive system has developed to the stage where it can use semisolid foods in a finely divided form.

It is essential at this age to include in the child's diet adequate amounts of vitamin A, thiamine, riboflavin, niacin and iron because of their relation to the growth of the body and their influence on the processes of the various systems which insure and maintain the health of the individual. Vitamin A keeps the epithelial cells (found in the membranes lining the nose, throat, lungs, tear glands and the digestive tract) in healthy condition and influences

the proper formation of the teeth. Thiamine helps the proper functioning of the whole digestive tract, including processes such as digestion and elimination, nerve regulation and the utilization of starches and sugars. It is closely related to other vitamins, hormones and minerals.³⁰⁵ Riboflavin shares in the enzyme systems, which regulate cellular oxidation, and is involved in the absorption of carbohydrates from the intestine. It also bears an important relation to amino-acid metabolism and is connected, to a certain extent, with fat metabolism.³⁰⁵ Niacin (nicotinic acid) occurs in all living cells in small amounts and is involved in all their life processes.

Amounts of vitamins recommended by the Food and Nutrition Board of the National Research Council, January 1943, for infants from six to eighteen months are:

Vitamin A.....	2000 to 5000 units
Thiamine.....	0.4 mg. (135 units)
Riboflavin.....	0.6 mg.
Niacin.....	4.0 mg.

An excess of vitamin A can be stored in the liver. Thiamine is completely absorbed in the small intestine but is not stored in the organism, although there are relatively higher concentrations found in the liver, kidneys, heart, muscles and brain.³⁰⁵

As indicated above, milk must be supplemented with an energy-giving food if the requirements for growth are to be met. Jeans and Rand estimate that in the first few months of life the child needs from 45 to 55 calories per pound of body weight. This amount diminishes gradually to 40 calories per pound at the end of the first year. Jeans and Rand¹⁸⁵ regard these allowances as minimum rather than optimum. Marriott and Jeans²⁴⁶ advocate 50 to 55 calories per pound during the first year.

To meet this need for more calories and vitamins some pediatricians give whole grain cereals or specially prepared, fortified proprietary cereal foods. Other pediatricians defer the giving of cereals until later and meet the requirement of this period with egg yolk, vegetables and fruits.

If whole grain cereal is given, it should be strained since the digestive tract of the infant is not mature enough to utilize the more complex food (see under Digestive System, Maturity of the Digestive System and Maturation of the Nutriture). The infant should be introduced to it in small amounts, $\frac{1}{4}$ to $\frac{1}{2}$ teaspoon

diluted with boiled milk or the formula. This is good feeding procedure and is psychologically sound. The cereal should be fed from the tip of a spoon and put well back on his tongue because his mechanism for swallowing is immature. As the infant learns to like and to take the cereal with zest, it may be given thicker, thus preparing him for the consistency of the next food to be introduced into his diet. At the age of one year, the infant will be taking about $\frac{1}{2}$ to $\frac{3}{4}$ cup of cereal when it is offered to him once or twice a day.

Cooked egg yolk is usually given at three to four months of age. When an infant is fed on cow's milk, his food contains about one-third as much iron as human milk, and pediatricians may advise at three or four weeks that egg yolk be given, after he has become accustomed to the formula which he is taking. It is wise to introduce the egg yolk in very small quantities, $\frac{1}{4}$ of a teaspoon to the whole day's supply. If at the end of two or three days he tolerates it and thrives, the amount can be doubled.

Sieved (puréed) vegetables are usually added at four to five months, and sieved fruits between four and six months. These foods, given twice a day, not only supply the needed food elements, but help to accustom the infant to variety in the flavor and texture of the food in his diet. We believe that this is the basis of good eating habits. The sieving of fruits and vegetables is to make it easier for the digestive tract to utilize their contents and to absorb them. The infant has as yet no teeth with which to masticate them. Like egg yolk, they should be offered the infant in $\frac{1}{2}$ teaspoon amounts and mixed with some of the formula until he learns to like their taste. If the amount taken is increased gradually, the infant will be taking two to four tablespoons of vegetables and two to six of fruits at one year of age.

Needs of the Child Reaching the "Premature" Nutritive Stage.—The infant's teeth usually begin to erupt sometime between six and nine months of age. This is the period when he puts everything in his mouth, and many think that this is the time when he is ready to learn to chew. By this time also the pediatrician has advised that chopped foods be introduced into his daily menu. He is given a piece of twice-toasted white bread, a dry crust of bread or a piece of zwiebach. It is important that he be given the opportunity to learn how to chew, for, it has been the common experience of those dealing with young children that those who have had only liquid and sieved foods throughout the first year frequently refuse

coarser foods when they are offered. During this period mashed vegetables, baked potatoes, liver soups and liver are offered to him.

By the time he is nine months old the average young child will be taking his food in three meals a day, with fruit juice and fish liver oil between meals. Some children are ready for this routine at an earlier age; with some it is delayed until later.

Importance of Early Experience with Foods.—When the child is a year old, if wisely fed, he will have become acquainted with and learned to eat almost all of the foods that form the basis for an adequate diet throughout his life time. The time to pay attention to food habits is while they are being formed, and during this first year the child is learning to eat. The attitudes established are, therefore, of the utmost importance in determining whether the future feeding of the child will be easy or difficult, and they will contribute in a real way to the attaining of radiant health as he develops. (The establishment of eating habits is discussed on page 234 ff.)

Importance of Balance in the Daily Food Intake.—All food substances needed by the body are equally important although required in widely differing amounts; the 6 mg. of iron required daily is just as essential to sound health in the young child as the 28 gm. (4000 times as great) of protein. The importance of maintaining balance in the nutrient is one of the more recent contributions to our knowledge of the nutrition of human beings. It takes a variety of foods to maintain this balance even in the diet of the young child. Overemphasis on any one food such as milk, eggs, liver, cereals or the vitamins may destroy the nutritional balance of the diet. Even milk, as excellent as it is as a source of calcium, proteins and fats, should not be used to the exclusion of other essential foods, notably those containing iron. Elvehjem et al.¹⁰⁸ found that of 750 infants coming to the child health centers in Madison, Wisconsin, approximately 21 per cent became anemic during the first year of life.

Meeting the Requirements of the Maturing Child.—The child is maturing rapidly all during his first year; he crawls, stands and moves his hands and feet almost constantly when he is awake. He uses more energy, he needs larger amounts of food and he is becoming increasingly independent. His body structure is maturing, his digestive system that formerly required puréed food can now utilize chopped food. This readiness of his body to use food

in a more complex form is indicative of the rapidity of the maturation of his nutriture. His willingness to change from puréed foods to chopped foods and to accept new foods is a sign that he is reaching nutritive maturity and will soon be ready for solid food.

Children vary widely in the time required to learn that they can eat solid food. Usually by the time a child has twelve to sixteen teeth, he is beginning to masticate his food quite satisfactorily and he can feed himself (not too successfully from the adult standpoint, but very well considering his stage of maturity). At this stage he begins to have some of his meals with the family and to share the family diet. This is, in a certain sense, a transition period from feeding himself part of his meal and being fed the rest by his mother, to participation in a group and becoming independent in taking on the job himself.

As soon as a child has learned to masticate his food, he can have foods such as adults eat and as they are prepared for the family. Root vegetables, such as carrots, beets and potatoes, are rich in their starch content and valuable in their minerals and vitamins but should be used moderately. Potatoes are a fairly good source of vitamin C, thiamine, riboflavin and iron, potassium and other minerals. They are alkaline in their ash content and in the diet tend to balance the acid-forming foods, such as eggs, meat, cereals and breads.

Green vegetables, such as spinach, chard, turnip greens and green string beans, are low in their starch content but valuable in their vitamin A content and in their minerals. Emphasis should be placed on leafy vegetables and fruits. For most children from 15 to 20 per cent of the total calories can be supplied by fruits and vegetables. A green vegetable should be a regular part of every child's daily food intake. Sugar should be used in the child's diet in small quantities to improve the flavor of food. All fruits contain some sugar, and there is reason to believe that they contain an amount adequate for body needs. In addition they are valuable sources of minerals and vitamins and usually contain appreciable amounts of cellulose, which occurs in the pulp and is a desirable source of roughage.

It is held by some that, because of the energy needs of children and their great activity, they need a generous amount of sugar in their diet. There is no convincing evidence available that children cannot utilize the energy available in foods which are valuable sources of energy and which furnish not only calories, but body-

building material as well. Those experienced in feeding children well-chosen diets know that such children do not crave sweets, that they can entirely omit sugar from their diet and never feel a desire for it. The palatability and flavor of the food, the quantity served, the quality of the food and the way in which it is prepared and the appetizing appearance are much more important factors to be considered than increasing energy intake with sugar.

Amounts of Food a Child Can Be Expected to Eat at This Period.—Adults often misjudge the amount of food a child should be expected to eat. They regard 2 to 3 tablespoonfuls as a totally inadequate serving, and yet for the young child it may be all he should consume at one time. From such observations as we have made, it seems much wiser to encourage variety in the diet rather than the consumption of large portions of a single food. For example, parents often complain that their children will not eat cereal. This is not surprising since cereal is one of the foods introduced early and is often given twice daily for many months, and frequently the same cereal is given over the entire period. Sometimes substituting another cereal for the one usually served, such as cracked wheat for rolled oats, or even another form of the same cereal such as shredded wheat for cracked wheat, will remove the child's objections to eating cereal. Breakfast cereal is not necessary as a part of the daily food intake of the child. It is a convenient way of serving the cereal grains, and the child may consume more than he would if it were prepared in some other way. It is generally accepted that cereals should not exceed 25 per cent of the total calories, unless cereals are used as a main source of minerals and vitamins. However, toast made from whole wheat bread, muffins made with whole cereals and mush made from cornmeal (made of whole grain) are excellent substitutes.

The Child Reaches Nutritive Maturity.—When the child can eat solid foods such as adults take, when he selects and combines them from their natural form and they are prepared for digestion and reduced to their simple form (ready for absorption) entirely within his own body, he is nutritively mature and his body is physiologically capable of utilizing the foods served on the family dinner table. When the child joins the family for his meals, he usually demands the meat that the other members have. He has had some finely cut meat and liver, but now he wants meat that he can chew. If he chews it thoroughly so that there will be no difficulty in digesting it, there is no reason for denying it to him.

Many children have reached this stage of maturity by their second birthday, although there is no chronological level to be fixed for the individual child. The problem confronting parents as the child enters the so-called "preschool age," is what amounts of the various natural foods shall be allowed in order to meet his requirement for maintenance and growth. Fortunately we can turn to research laboratories which have conducted balanced studies to determine the requirement of protein, fat, carbohydrate and minerals for children of this age group (two to five years).

Protein Requirement.—Daniels⁸⁷ and her co-workers made nitrogen-balance studies of the protein intake of twenty-four children between thirty-six and sixty-six months of age. During the observation period the children were under controlled conditions for from fourteen to twenty-one days. The caloric needs of the children were considered from the point of height and weight. With but few exceptions the food supplied 40 calories per inch of height or between 80 and 112 calories per pound of body weight. During the study the children gained in weight, thus ruling out the possibility of undernutrition as a factor influencing the nitrogen retention. The amount of protein given varied from 0.9 to 1.6 gm. per pound of body weight. This was evenly divided among the three meals. From their experiments it was concluded that children of these age levels should receive approximately 1.5 gm. of protein per pound of body weight in diets furnishing at least 50 per cent of the protein from animal sources.

In a study of the daily food intake of children at the Merrill-Palmer Nursery School, as reported by their parents, the total amount of protein eaten by children of the same age level was greater, although the amount consumed per pound of body weight was about the same as the children in the Daniels' group. The range of protein in the diets of the Merrill-Palmer children of the same ages was from 0.89 to 2.5 gm. per pound of body weight. The chief difference in the diets of the Merrill-Palmer group seemed to lie in whether the child had meat, egg and milk or just milk and egg.

Fat Requirement.—Most fats are readily synthesized by animals from other foods, but there are certain fatty acids which must be supplied in the food. Researches indicate that the inclusion of the fat components, linoleic and linolenic acids, are necessary and that choline and certain "essential" fatty acids, the nature of which is not entirely established, are needed for proper fat metab-

olism. Fats which have vitamin A in solution are more desirable than those without it. Cream and butter are the most familiar foods supplying fat and vitamin A. Cod liver oil is not only a fatty substance giving protection against rickets through its vitamin D, but when included in the diet is a valuable source of vitamin A. It is wise to give only moderate amounts of fats, probably not over 1.5 gm. per pound of body weight. If a child receives a quart of milk a day, a small amount (1 ounce) of butter, 1 egg, and the fat which is found in his other foods, he will receive very close to his daily fat requirement.

Carbohydrate Requirement.—The amount of carbohydrate in the food intake of 124 preschool children in a study made at the Merrill-Palmer School was shown to be approximately 5.0 gm. per pound of body weight. There was wide variation in the individual intake; it ranged from an average of 3 to 8 gm. per pound of body weight. This indicates the widely differing food choices in families and the individual differences which should be recognized. A detailed study of the items in the diet revealed that the carbohydrate had been taken in the form of cereals, vegetable starches, whole wheat bread and fruit sugars. These are desirable forms in which to secure carbohydrate since they combine starch or sugar with minerals, vitamins and cellulose. It is well to plan to include a raw and a cooked green vegetable in both the midday and the evening meal, to insure as large a supply of minerals and vitamins as the child needs.

Energy Needs.—Very little work has been done either in measuring the basal metabolism or determining increases due to activity of children between three and five years. Robb,²⁹⁶ in a study of energy requirement of a group of children at this age level, found that their basal metabolism values exceeded those reported by Benedict and Talbot by 10 per cent for boys and 15 per cent for girls and that the energy required for activity during periods of quiet play represented an increase of approximately 70 per cent over the basal requirement. A study* made at Merrill-Palmer School of the energy value of the food consumed in a seven-day period by two groups showed that for fifty-seven boys and girls between three and four years the average intake was 1509 calories, or 45 calories per pound of body weight, and for forty-four boys and girls between four and five years the average intake was 1585, or 41 calories per pound of body weight. That this allowance was

* Unpublished data.

adequate was evidenced by the records of the height and weight gains of these groups over a twelve-month period, which either equaled or excelled the accepted standards of growth. The recommended calorie allowances of National Research Council, January 1943, for this age level ranges from 1200 to 1600 calories, or about 40 calories per pound.

It is important not only that the energy requirement be met but that the distribution of the calories among the food groups be adequate.

Rose, Robb and Borgeson,³⁰¹ in an investigation of the diets of 163 nursery school children, made a study of the distribution of calories furnished by six food groups. Their findings demonstrated that children whose food intake showed a distribution of calories approximating the median value for each group had an excellent dietary, adequate in protein, calcium, phosphorus and vitamins, although not as high in iron and vitamin B complex as may on further investigation prove to be desirable. Children with less than 40 per cent of their total calories from milk did not have an optimal intake of calcium and sometimes not of phosphorus. Those with low milk tended to higher sugar and meat, foods which are deficient in growth-promoting properties. In the light of this study they suggested a new standard of distribution for nursery school children as follows:

	Percentage of total calories.
1. Foods from cereal grains.....	18-20
2. Milk.....	45-55
3. Fruits and vegetables.....	16-22
4. Fats and oils.....	4-8
5. Sugars.....	1-3
6. Eggs and meats.....	3-5

Mineral Requirements.—Stearns and Jeans^{186a} gave children four to twelve years of age diets in which the calcium was adjusted to equal that contained in either one pint or one quart of milk, and found as a rule considerably higher retentions with the higher calcium intake.

Daniels⁸⁹ studied two girls and eight boys three to five years old, who were exposed twice daily to the rays of a sun lamp for ten minutes and once daily received 1 teaspoonful of cod liver oil with additional viosterol. This assured not only adequate vitamin D, but also vitamin A, both of which favor calcium storage. They

also were given twice daily a portion of orange juice, which is high in vitamin C and likewise aids in calcium retention. The children received a pint of milk, but the choice of foods was such that the children receiving the pint of milk were getting as much total calcium as would be included in a pint and a half. The total calcium daily intake of the group was from 0.77 to 0.90 gm. of calcium. The retention was from 9 to 12 mg. per day, the increasing of the calcium intake above 1 gm. did not make any marked increase in storage.

In a study made by Rose, Robb and Borgeson³⁰¹ on fifty-eight children in the two-year group and ninety-two children in the three-year group it was found that the total calcium intake ranged from 0.78 to 1.5 gm. per child per day, with median values of 1.13 and 1.17 gm. per day for two- and three-year-olds respectively. The total phosphorus intake ranged from 0.84 to 1.54 gm. per child per day, with median values of 1.14 and 1.18 gm. for two-year-olds and three-year-olds respectively.

Since a quart of milk will meet this requirement of 1 gm. of calcium per day it has been generally accepted that this quantity should be included in the child's diet. It is not necessary that all of the quart be drunk; it can be concealed in creamed dishes, creamed soups, custards and numerous other ways. It would seem that the character of the diet with which the milk is taken would be the determining factor in reducing the quantity given a child. A child receiving a diet adequate and even optimal in every food essential could undoubtedly take a pint and a half. There is little reserve store of iron in the body, and the amount present in food is relatively small, hence it is important that the daily food intake should afford an adequate supply and that conditions be maintained favorable for its absorption. Recent research studies indicate that there is a smaller amount of it absorbed than was formerly thought.

Studies of iron requirement are difficult to make because the experimental period must be long and the analytical technics require skill and the most meticulous care.

Stearns and Stinger³⁴⁹ found that at least 0.5 mg. per kilogram of body weight was necessary to secure retention of iron in infants; that retention was more regular as well as considerably larger when 1.0 to 1.5 mg. per kilogram was given, whether the source was eggs, iron-fortified cereal or a simple iron salt.

Daniels and Wright⁹⁰ made iron-balance experiments on eight

children from three to six years old, and Ascham¹⁸ made a study on six children from four to six years old. In these studies equilibrium was established at 0.4 to 0.55 mg. per kilogram of weight but there was no storage. Significant storage took place at 0.6 mg. per kilogram, but retention was better at 0.65 to 0.75 mg. per kilogram. These studies indicate that an allowance of 0.6 to 0.7 mg. per 100 calories is desirable for children of preschool years.

Rose and Borgeson³⁰² had a group of sixty nursery school children under observation for from six to twenty-one months on an inexpensive diet in which two-thirds of the total calories came from milk and cereals and one-fifth from fruit and vegetables. One-half of the children had an egg added to their diet daily and the other half had no egg. The thirty children who had their iron intake increased about 10 per cent by the addition of an egg to their diet manifested a definite trend toward higher hemoglobin values than an equal number carefully paired with them as to age, sex and living conditions, who received no eggs. The iron intake for the egg group ranged from 0.5 to 1.0 mg. per kilogram of body weight. Eggs, liver, meat, green-leafed vegetables, whole grains and certain fruits are iron-rich foods.

McCollum points out that "iron to be absorbed must be soluble and ionizable, and in a ferrous state. Unless the element can be converted into this form before passing into the lower part of the small intestine, it is excreted. Iron in hematin, the pigment in hemoglobin, is not liberated by ordinary digestive processes and is therefore not absorbed."*

It has been demonstrated that, in order for the body to utilize the iron in the diet, a certain amount of copper must be present. The fact that vegetables, cereal, fruits and meat contain appreciable amounts of copper has seemed to insure a sufficient amount for the body needs if the diet is adequate quantitatively and qualitatively. It is now thought that inorganic iron may be used by the body if copper is present.

Among the factors, besides copper, influencing the utilization of iron are the vitamins and the reactions of the intestinal tract which affect the solubility of the salts and thereby influence their ability to pass through the intestinal wall. An acid medium in the duodenum favors more complete utilization of the iron, while an

* McCollum, E. V., Orent-Keiles, E., and Day, H. G.: *Newer Knowledge of Nutrition*, New York, Macmillan, 1939, p. 221. By permission of the publishers.

alkaline medium causes the formation of insoluble salt that is incapable of absorption and, therefore, will be excreted in the feces.

Table 9 gives the amount of food reasonable to ask a child of two, three or four years to eat at one meal.

Facts to Remember When Planning the Food for the Young Child.—It is unwise to try to set standards of food intake for any one child based upon observation of other children. Each child must be studied and his individual variations noted and considered in planning his food intake, although his individual variations

TABLE 9.—AVERAGE SERVING OF FOOD FOR CHILDREN TWO, THREE AND FOUR YEARS OF AGE

Food	Two-year-old	Three-year-old	Four-year-old
Milk	1 cup	1 cup	1 cup
Milk soup	$\frac{1}{3}$ cup	$\frac{1}{2}$ cup	$\frac{2}{3}$ cup
Egg dish	3 tablespoons	$\frac{1}{4}$ cup	$\frac{1}{3}$ — $\frac{1}{2}$ cup
Meat:			
Patties	2 tablespoons	$\frac{1}{4}$ cup	$\frac{1}{4}$ cup
Roasts	$\frac{1}{2}$ ounce	$\frac{3}{4}$ ounce	1 ounce
Creamed	3 tablespoons	$\frac{1}{4}$ cup	$\frac{1}{3}$ cup
Vegetables:			
Cooked (mild flavored) . . .	$\frac{1}{4}$ cup	$\frac{1}{3}$ cup	$\frac{1}{3}$ — $\frac{1}{2}$ cup
Uncooked (diced)	Taste	2 tablespoons	$\frac{1}{4}$ cup
Uncooked (strips)	2 strips	4 strips	6 strips
Fruit	$\frac{1}{3}$ cup	$\frac{1}{2}$ cup	$\frac{2}{3}$ cup
Puddings, whips, custards, blanc mange	$\frac{1}{3}$ cup	$\frac{1}{2}$ cup	$\frac{2}{3}$ cup

should not interfere with his receiving an adequate balanced diet. Those responsible for children at this period should know the amounts of different foods which normal, healthy children have been found to consume. Overfeeding during this period of a child's life may cause a negative attitude toward food, which is not his reaction to the specific food given him but the physical effect of overfeeding.

It is essential to provide everything necessary for the child to grow strong and also to build the right kind of foundation for the habits of a lifetime. "One year of good feeding at the beginning of

life is more important than ten after forty, and a baby's needs are not to be judged by an adult's inclinations. Feeding must be a matter of principle and not of impulse; the reward will be partly in the present—much more in the future.”*

This period is so important in establishing a normal appetite, good attitudes toward food and good food habits, that undue emphasis cannot be placed upon it. The adult assumes great responsibility in the choice of food placed before the child and the way in which it is prepared. It would be well to keep the following requirements in mind:

1. The energy requirement of children per pound of body weight is higher than adults. The energy is derived from protein, carbohydrate and fat. After the protein requirement has been met, the remainder can be obtained from the other foods. One-half may be obtained from the carbohydrates found in fruits, vegetables, milk and cereal grains; 35 to 40 per cent may come from the fat of milk, butter and eggs.

2. The food of the young child should contain a higher percentage of growth-promoting protein, essential for building tissues, than the adult. It has been estimated that growing children usually require more than twice as much protein per pound of body weight as the adult. It is agreed that probably about two-thirds of the protein should be from animal sources such as milk and eggs.

3. Certain mineral salts are essential to health and life and children's diets should include an adequate amount. In childhood it is estimated that the calcium requirement is three to four times as much per pound of body weight as in adulthood.

Milk is a richer source of calcium than most other foods and it is difficult to plan a daily food intake adequate in calcium without using milk. The iron requirement may not be met unless planned for by adults, since iron is not widely distributed in foods. To protect the child it must not only be present in sufficient quantities but must be qualitatively such that the body can use it.

4. The day's food must contain a higher proportion of vitamins than for the adult. Vitamins are necessary for the child's growth and development, for aid in the functioning of the digestive and nervous systems, in the metabolism of fats, amino acids, and carbohydrates and in the maintenance and health of the body.

5. *The diet of children should be selected with care to include only those foods which they can easily digest.* The choice should

* Rose²⁹⁸ (p. 184). By permission of the publishers.

guard against including too much fat (and fried foods), since fat delays the passage of food from the stomach into the intestine. The digestive tract of the young child is not equipped to handle the amounts or the rough, coarse food that adults take. The mucous membrane of the intestine is sensitive, and too much roughage irritates it and causes digestive upsets.

MEALS FOR FAMILY FOR ONE DAY

MENU I

Breakfast

Orange or grapefruit
Cracked or granular wheat or
rolled oats with whole milk
Milk to drink

Lunch for Family
and
Dinner for Child

Eggs à la goldenrod
Buttered cabbage
Carrot strips
Bread and butter
Apple—diced or baked
Milk to drink

Dinner for Family
and
Supper for Child

*Meat loaf with tomato sauce
Potato, baked
Green beans
Bread and butter
Salad, lettuce
Apricot and banana mold
Cookies
Milk to drink

MENU II

Breakfast

Prunes
Ready-to-serve cereals made from
corn, wheat or rice, with whole
milk
Milk to drink
Toast, whole wheat

Lunch for Family
and
Dinner for Child

Vegetable soup with liver
Muffins
Fruit salad
Baked custard
Milk to drink

Dinner for Family
and
Supper for Child

*Baked fish balls
Greens, buttered
Rice or macaroni with cheese sauce
Bread and butter
Fruit milk sherbet
Milk to drink

* May be omitted for young child.

In our experience covering the last twenty years of observing and feeding children, we have found the most successful way of securing an adequate diet for a young child is to set up a basic ration which will satisfy the needs of his body. Families differ in their cultural patterns, in their food habits, in their food preferences and in their incomes, and as long as the child's needs are met, there is every reason for giving consideration to these other factors in their social and cultural background.

The following basic ration has proven satisfactory to the parents and has provided the children with the materials necessary for excellent growth and development.

The day's basic ration should include:

- 1½ pints milk
- 1 egg or its equivalent in meat, fish or liver
- 3 slices whole wheat bread
- 2-3 teaspoons butter
- 1 uncooked green leafy or yellow vegetable (if preferred, used in a sandwich or salad)
- 1 cooked vegetable
- fruit or a dessert flavored with fruit
- to this add some starchy food

The menus on page 233 illustrate how the foods suggested in the basic ration may be combined into a menu for a day.

EATING HABITS

The foundation for good eating habits is laid, as we have said, when the newborn infant has his hunger promptly satisfied. He is thus conditioned to the natural sequence of hunger, ingestion of food, satisfaction, physical well-being. As indicated earlier, in hunger a series of contractions of the stomach occurs, causing hunger pangs, announced by the infant by crying. These hunger pangs are not under the control of the higher brain centers but rather under subcortical control. Appetite, or the desire for food, which is dependent in large measure upon pleasant experiences with food, is, however, so intimately related to the higher brain centers as to make its complete suppression entirely possible through a series of unpleasant associations with or memories of food. It becomes our task, therefore, to nurture appetite by building up pleasant associations with food.

In discussing early infant feeding on demand we have already introduced a major principle which we need to consider throughout the growth years, namely, allowing the child as much independence as he is capable of assuming and permitting him the satisfaction consequent to successful accomplishment.

Experiments in Allowing Children to Choose Their Foods.—Dr. Clara Davis⁹³ experimented for a number of years with a group of newly weaned babies who were allowed to select their own food from a variety of natural foodstuffs. Nothing was done to influence

the choice of the child, and all pressure and inhibition were removed. The food was natural, unmixed and unseasoned, and suitable for children. Each child ate alone and had a tray with all the food before him, and a nurse helped him to get the food he could not reach. No food was offered either directly or by suggestion. The children ate their food eagerly, in a matter-of-fact way, ate astonishingly large quantities of food, and stopped with an air of finality. From the standpoint of appetite and digestion, optimal results were shown, the children's general physical condition indicating that their nutrition did not suffer but was well above average. It should be noted here, that all foods offered the children were good for them. They were not exposed to undesirable foods.

Dr. Davis demonstrated that wrong psychology can be responsible for the majority of food refusals among young children. The question of how far the average home can adopt Dr. Davis' method and insure the child an adequate diet and preserve the ideal psychological setting is a problem. Dr. Davis herself has demonstrated that an adaptation of this method can be used successfully in a private home, as well as in routine feeding of children in a hospital.⁹⁴ However, it is doubtful if the average woman could adapt the method successfully to her surroundings and adequately nourish her children. Dr. Davis' experiment demonstrated that under certain conditions the complete removal of pressure and the granting of freedom in the choice of foods suitable for children would help to develop normal food habits and would avoid many problems faced by the average parent.

Dr. Lydia Roberts tested a modification of Dr. Davis' method with nursery school children and had reasonable success. In her experiment the meal was eaten in a more business-like manner in a shorter period, and more food was consumed than under the former nursery school procedure. Dr. Roberts says "It was obvious, therefore, that if given a proper selection of food for the trays, children could be well nourished by this means, but doubtful whether they would develop new food likes thereby, since unliked foods remained untouched throughout the experiment. While it is certainly not essential that every child learn to like all foods equally well—from the standpoint of nutrition, indeed, he might live throughout life on but two or three foods, if these were properly chosen, and be perfectly nourished—nevertheless in the social setting in which most children live the desirability, if not the

necessity, of learning to eat a well-balanced diet consisting of most of the foods found in the usual dietary of the locality is obvious."*

Introduction of New Foods.—A few adventurous infants and young children accept new foods with joy the first time they are offered, even foods with such definite flavors as asparagus and cabbage. More often, however, the child learns through repeated experimentation to accept the new food. Thus, for most children it is wise to consider the introduction of each new food as an educational procedure at first rather than as a means of meeting nutritional need. One method is to offer a very small amount of the new food in the same meal with some food which the child already likes. With some children the new food is best accepted early in the meal while appetite is keen. With many others it is advisable to allow the child first to satisfy hunger and at least part of his appetite with some food he likes before he is expected to sample the new food. In either case, if the food is offered with the attitude that it will be eaten, the chances are much better that it will be.

The esthetic effect of the food itself has a marked effect upon the appetite of the child just as it does upon that of the adult. The sight, taste and smell of the food served make a direct appeal to the senses. Meals planned to offer contrast of color, flavor and texture attract children as they do adults. Important at any time, careful preparation becomes especially important when some new food is being offered. Each pleasant experience with a new food goes far toward building right attitudes toward the acceptance of other new foods. On the other hand, one serving of food that is burned or undercooked or too hot gives an unpleasant sensation that may give rise to a food prejudice which may require months of re-education to overcome. It may also make the child fearful of trying other new foods.

It is true of new food consistencies or textures, as it is of new foods, that, while some children readily accept texture changes, other children require a period of slow education. Thus, when the infant is transferred from puréed foods to junior chopped foods at about eight months, it may be necessary to introduce only a small amount of the chopped food, together with a normal serving of the purée to which the baby is accustomed. An occasional infant who completely refuses chopped foods may readily

* Roberts²⁹⁷ (p. 555).

accept whole carrots, beans, or other vegetables which he can hold in his hand and feed to himself.

As said on page 166, it is essential that the child be accustomed to different types of food so that he can learn to chew properly and can exercise his teeth and gums. Tough foods are not advisable, but vegetables, cooked and raw, certain raw fruits, bread crusts, toast and other foods which offer some resistance to the teeth, are useful aids in teaching mastication, which must be learned.

Introduction of New Eating Utensils.—The use of each new eating utensil must also be learned. If this fact is ignored, what seem to be food refusals may sometimes be rather refusals of the utensils with which the food is offered.

Before vegetables or cereals are offered to the baby—usually sometime between two and four months—it is well to accustom him to the spoon by using it several times before this to feed him his orange juice. In this way when he is asked to accept the cereal or vegetable, whichever the doctor orders first, he has only one rather than two things to learn at the same time. He is already accustomed to the spoon, and now has only to learn to eat the new food. The same principle works when he is asked to drink milk from a cup rather than from his mother's breast or a bottle. Water and orange juice can be given from a cup for some weeks in advance. Also, a small quantity of milk offered from a cup between meals once a day for several days makes it easier for the baby to accept a whole milk feeding in this way when the cup is first substituted for the bottle or breast at the feeding hour. Even with this preliminary education it is too much to expect of the baby to require him to give up the breast or bottle at all three feedings at the same time. He should be allowed ample time to become thoroughly accustomed to drinking his milk from a cup at one meal before he is asked to do so at a second and finally at a third.

The time of weaning from breast or bottle to cup varies greatly with the rate of development of the child. For most children sometime during the last quarter of the first year is an appropriate time, although some are ready earlier and some are not ready until much later. Most well-cared-for babies in our culture are drinking from a cup by fifteen months, however. Sometimes babies fed on a self-demand regimen actually wean themselves. Between eight and eleven months a number of them have bitten the mother's nipple or artificial rubber nipple and pushed the breast or bottle

aside. When the mother, having already educated the baby to drink from a cup, has recognized this signal and offered milk from a cup at this feeding, the infant has accepted it readily. At a further signal from him, his mother has then offered a cup of milk at another, and finally at the third feeding. Thus weaning has been accomplished gradually at the baby's own pace without any emotional strain on either the infant or the mother.

It should be pointed out, however, that not all infants wean themselves as definitely and as readily as this. Biting the nipple may not necessarily mean that the infant is ready to discontinue sucking from his mother's breast or the bottle. However, by the time the baby is seven or eight months old, or even earlier, it is usually wise to try his orange juice and water from a cup as suggested above. When he becomes proficient in this he can occasionally be offered small amounts of milk from a cup. If his mother regards the whole procedure as a gradual learning process and accepts what the baby does do successfully but, at the same time, shows no impatience because of what he does not do, weaning is usually accomplished quite easily.

If weaning from the breast is necessary for any reason before the eighth or ninth month, it is usually better to wean from breast to bottle and later from bottle to cup. When breast feeding can be continued until the infant is ready for a cup this intermediate stage, with its accompanying burden of formula and bottle and nipple sterilization, can be avoided.

The age at which the baby can skillfully handle his own cup varies widely, too. Before he achieves this, he will go through a period of contentedly allowing someone else to hold the cup. A little later he will put his hands on the cup to assist. Before he acquires the skill to lift, to tilt correctly and to replace the cup, there will usually be a phase in which he insists upon holding the cup for himself but tilts it too far and spills the contents. There are apt to be times, too, when he awkwardly sets the cup down on his spoon or the rim of his tray and spills milk into the tray, or, even more trying to his mother, when he drops or throws the cup to the floor. If such accidents create too much commotion, they may sometimes be deliberately repeated to gain attention. However, the wise mother sets the high chair on the kitchen linoleum before the feeding is begun, and such accidents can be cheerfully ignored, for the floor is easy to clean when the baby's feeding is finished.

Learning to use a spoon, a fork and a knife are gradual processes too. For a long time the infant is quite content to have the spoon manipulated for him. Figure 32 shows a baby at seven months in the very early stages of learning to feed himself. It is

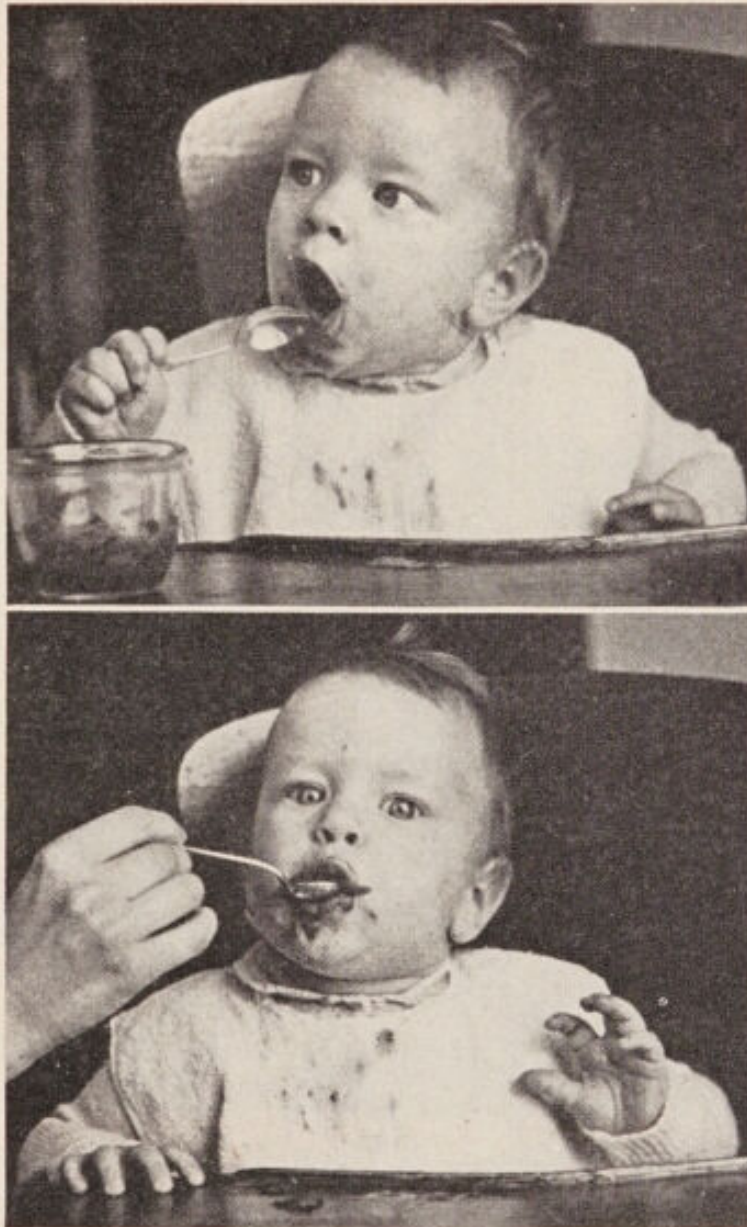


Fig. 32.—In the upper photograph this child, seven months of age, has grabbed the spoon, thus indicating his readiness to begin the early steps of learning to feed himself. After allowing him to handle the spoon a few moments his mother actually feeds him all of his meal.

months, however, after the baby shows an interest in the spoon before he is able to load the spoon and carry it to his mouth without dumping the food. Usually by two years he can do so with a reasonable degree of skill. Even at eighteen months, however, he can take over a great deal of the task of feeding himself. At eight-

een months he spills a great deal and at three years he will probably still spill some. Spilling is unimportant, however, and should be so regarded. Opportunity for the maturing child to practice growing skills is of paramount importance. He should be permitted to do so without criticism from adults. Some children can use a fork at two years (Fig. 33) but a spoon or fingers are usually



Fig. 33.—The same child shown in Figure 32, now twenty-four months of age, eats well with a spoon and begins to use a fork, but birthday cake still goes better with the fingers. An unnecessary discipline problem would arise at this stage if he were forced to eat cake with the fork.

preferred at this stage. Often the child tires of manipulation before the meal is completed and welcomes some adult help to finish. The use of a knife and fork together to cut food is a very complex skill, but it is achieved by quite a few five-year-olds.

This whole period of learning to manipulate various eating utensils is a difficult one for the child. He often wants complete independence in feeding before he is fully capable of assuming it.

Yet it is wise to allow him a great deal of freedom even though his messiness may be very trying to adults. He will get the food, or at least an adequate portion of it, to his mouth if nothing is done to interfere with his appetite. Acceptable table manners will be acquired later when the mechanics of eating have been so mastered that they no longer require all of the child's attention. Whether the child begins to eat at the family table as soon as he



Fig. 34.—Participation in its preparation stimulates children's interest in food. (Sweeny, M. E., and Buck, D. C.: *How to Feed Young Children in the Home*. Detroit, Merrill-Palmer School, 1937.)

can feed himself part of his meal or whether he eats alone till he is three or four years old is a matter for each family to decide. Whether the child comes to the family table at eighteen months or four years, however, if he is left alone, he will gradually acquire acceptable table manners through imitation of the example set by the adults at the table. Occasional suggestion as he is able to understand it may be helpful, but nagging should be carefully avoided.

It is not unusual for the child when he first joins the family for meals to indulge in behavior which may be very trying to the other members of the family. For many months, because of his physical dependence, he has had to be fed and waited upon; when he comes to participate in the family meals, he still desires to be the center of attention. If he finds himself ignored, he will resort to almost any device to secure adult consideration, such as refusal to eat, temper tantrum or dawdling.

Interest in Food Stimulated by Participation in Its Preparation.—There should be opportunity for the child to spend some time in the kitchen. The toddler who spends long hours in the kitchen playing with pans, pots and spoons grows accustomed to numerous food odors, and the good time he has in the kitchen with his mother while these odors are assailing his nostrils must certainly help to condition him pleasantly toward these foods. The nursery-age child who is allowed to actively participate in the preparation of some of his food will acquire a sense of pride in accomplishment which will make him keenly interested in eating the foods he has helped to prepare. Figure 34 shows two children intent upon preparing eggs for their nursery school lunch. Their enthusiasm at the lunch table is sure to be contagious and to help other children to enjoy this food too.

Importance of Environment.—As we have suggested, the physical environment at mealtime is important. A good environment includes a comfortable position in a high chair or at a low table; it includes also appropriate and attractive dishes and eating utensils, as well as attractive and palatable food.

As important as the physical environment is, however, the psychological environment is of even greater importance. There needs to be a happy relaxed atmosphere free from emotional tension both at mealtime and during the child's preparation for the meal. "Freedom from emotional disturbances at mealtime . . . contributes to pleasant associations with food and makes it possible for the child to digest and assimilate the food he eats. Pleasant conversation and an atmosphere of relaxation and comradeship are better than a discussion of the difficulties of the day."*

DEVELOPMENT OF CONTROL OVER ELIMINATION

Elimination a Basic Element in the Maintenance of Bodily Comfort and Well-Being.—Since evacuation of the bowels as a

* Breckenridge⁵¹ (p. 537).

basic physiologic need has been discussed in Chapter V, page 181, and urination as another essential part of elimination has been discussed in the same chapter on page 183f, our concern here is with training in cleanliness as a phase of the child's acculturation.

Bladder Control.—The optimum time to begin training for bladder control seems, in our experience, to be that time when the run-about child is capable of making an appreciable response.* The study conducted by McGraw of the training of two sets of twins in bladder control has been referred to in our discussion of urination on page 183. This study indicates that the time when the child has reached this stage comes some months after the development of the cortical centers governing sphincter control. It comes only after the child has also developed powers of discrimination and generalization and is able to integrate these powers with the act of micturition. In the case of Hugh Putney in the McGraw study this period began at about the age of twenty months. At this time there was a sharp rise in his success curve which was stabilized in the ninetieth percentile by the time he was two years old.

Usually the mother is forewarned of the approach of this propitious period by the child's frequent reporting of "accidents." If during this preliminary period the child can be given opportunity to observe other children on the toilet, and if he is occasionally placed there himself after a meal or when he awakes dry following his nap, it is usually not long before he begins to report before rather than after an accident. When this happens he is well along the road toward self-control of this function. At this time a little judicious praise for successes will do much to increase the frequency of control. However, praise can be overdone and result in too much concentration upon a normal physiologic function. Mothers should not expect immediate 100 per cent self-control. Bladder control, like walking, must be learned and, just as the toddler has many falls before he finally learns progression in an upright posture, so there will also be a series of progressions and regressions before he is completely master of the toilet situation. "Even after the child has become proficient in verbalizing his

* For a summary of maturational patterns of behavior preceding this and for maturational patterns in bowel evacuation the student is referred to Gesell, A., and Ilg, L.: *Infant and Child in the Culture of Today*. New York, Harper & Brothers, 1943, pp. 321-333.

needs before voiding there may occur another regressive phase as his horizon of interests and imagination come into play. At this time the child is too occupied with new experiences to take notice of the old bladder sensation. Subsequently the child will be able to respond to physiological urges and to attend to play interests at the same time. When he is observed squirming, holding his legs tightly together, but at the same time absorbed in play, one can know that he is on the verge of a new level of control. The time is approaching when he will be able to manage both functions satisfactorily. Soon he will be able to drop the play, relieve the bladder pressure, and return to pick up the play activity where he left it."* Then, indeed, has he achieved bladder control.

It is often possible for a mother, if she is anxious to do so, to keep a docile, submissive child dry much of the time for many months before the child himself is ready to take on any personal responsibility for this act. This procedure, however, often dulls the natural enthusiasm and interest which the child would have had, had training been delayed until he himself was ready for an appreciable response.

In the case of a more self-willed, aggressive child there is very likely to be active resistance to toilet placement if it is attempted before the child himself is ready for active, conscious participation. If training is forced upon this child, a train of unpleasant associations may be started which will greatly delay successful education in this control later.

When E. R. was sitting alone with confidence at thirty-eight weeks, her mother tried putting her on a nursery chair at her doctor's suggestion. E. R. rebelled, however, and after a few trials her mother wisely gave up the attempt at training. The second attempt several weeks later was met with the same behavior on the part of E. R., and again her mother desisted after a few trials. When E. R. was thirteen months of age her mother tried again to initiate training in bladder control. This time E. R. was seated on a "Toidy" seat with a stool for her feet. Again there was resistance or disinterest. However, her mother persisted at regular intervals for three days with approximately fifty per cent of the missions successful. Because of the resistance, however, the attempt was again abandoned until E. R. was seventeen months old. This time she accepted the toilet for bowel evacuation but again rebelled against the frequency with which her mother took her to the

* McGraw²³⁴ (p. 127).

toilet for bladder elimination. Again the mother abandoned the effort except for bowel movements. By eighteen months E. R. was saying "toi-toi" far enough ahead of a bowel movement to enable her mother to place her on the toilet seat in time for this procedure. Although she was having two or three bowel movements a day at this time, E. R. rarely had an accident. At about twenty months she began to be aware of her wet pants and came to her mother to be changed. Within a very short time she began with increasing frequency to say "toi-toi" in advance of this function also. By twenty-two months E. R. consistently asked to go to the toilet, even calling her parents during the night when she needed to go. When she was two years of age, her mother reported that she was occasionally wakened during the night by E. R. in the bathroom in the dark alone rattling the toilet seat. Such independence is unusual for a child of two, of course, but it does illustrate how rapidly an intelligent child may assume personal responsibility for eliminative behavior when adult guidance follows the maturity cues which the child herself gives. At twenty-six months E. R. went with her family to a cottage on the water. There the many new and fascinating experiences were sometimes so absorbing that toilet needs were forgotten, and there were wet pants occasionally. When this happened E. R. would say, "Oh! accident, I sorry." After a few weeks in the new environment, however, she was able to stop her play in time to reach the toilet to relieve the bladder pressure. Before thirty months she was entirely reliable in her ability to control this function.

Bowel Control.—The vegetative nervous system and the higher brain centers are coordinated to bring about control of both bladder and bowel sphincter release. Bowel control is as complex a behavior pattern as is bladder control except for the fact that it is necessary to exercise it less frequently. Bowel control can usually be achieved by the child much earlier than bladder control can be. Ordinarily shortly after the child has learned to walk well, he responds readily to toilet placement if his mother selects a time after a meal when increased peristalsis is more likely to produce an evacuation. If she notes for several days the meal after which a bowel movement is most apt to occur she can select this time for placement. In this, as in training for bladder control, which usually begins after bowel control is well established, there will be advances and regressions. However, most babies between fifteen

and eighteen months, if they have been occasionally introduced to the toilet, will begin to give some advance indication of the need to defecate and will respond successfully to toilet placement a high percentage of the time. E. R. would probably have achieved bowel control somewhat earlier had her mother attempted this phase of her education singly. Possibly thus the resistance created by the frequent interruption of play necessitated by the more frequent placement might have been avoided. E. R. did, however, achieve consistent bowel control several months before she acquired bladder control.

In the case of N. L. this order was reversed, possibly because his busy mother had no time to observe and take advantage of his natural rhythm in bowel evacuation. His mother, forced to support herself and her son, was teaching in a nursery school which N. L., although under age, was permitted to attend. By the time he was sixteen months old he showed some evidence of discomfort when wet. His mother had a week of freedom from her teaching duties and decided to initiate his toilet training. The first day she put him on the toilet every hour. This was obviously unnecessary. On the second day she extended the interval to two hours with almost one hundred per cent success. By the end of the week she was taking him to the toilet six or seven times during the day at convenient intervals. This was continued when mother and child returned to the nursery school. N. L. readily accepted the procedure and was usually dry during the day, but his mother assumed responsibility. By nineteen months he quite regularly indicated his need in advance by pulling an adult toward the toilet. At about this time while sitting on the toilet after breakfast he began to evacuate his bowels after he had urinated. Soon he refused to get off the toilet after urination if he felt the need to defecate, but would answer attempts to lift him from the toilet by grunting. At twenty-one months he used the term "toitet" to express the need either to urinate or to defecate. At this time he usually slept through the night—eleven to twelve hours—without urinating, or, if he needed to do so, he waked and called "toitet." In a nursery school with older boys he had opportunity to observe that they urinated while standing. Before N. L. was twenty-four months old he had adopted this posture on his own initiative. At this time his mother reported that he had had no toilet accidents either during the day or night for two months.

PROTECTION AGAINST COMMUNICABLE DISEASE

An extremely important factor in the maintenance of bodily comfort and well-being is the negative one of prevention of illness and thus of pain and discomfort. Attention to bodily needs, especially nutrition, elimination, fluids, oxygen, sleep and activity will do much to insure the infant and young child a sound healthy body with good general resistance to disease. Guardians of the child's health can and should do more, however. They should make it possible for him to develop an active, specific immunity to as many of the acute communicable diseases as possible.

The newborn infant, if his mother is immune to these diseases, is immune for several months to measles, scarlet fever and diphtheria. Antibodies from the mother's blood are passed through the placenta to the fetal blood and the infant is born with a passive immunity. Unlike the passive immunity which follows an injection of immune serum and lasts only three or four weeks, the passive immunity of the newborn lasts for several months. This is fortunate, for the very young infant appears to be incapable of building his own antibodies. Also, "after the passive immunity is lost a period of susceptibility ensues greater usually than that shown by older children."*

Newborn infants are usually not immune to whooping cough. The number of deaths from whooping cough among young children in the United States is greater than that due to scarlet fever and measles combined. Of the 31,230 deaths from whooping cough in the United States between 1930 and 1935, three-fourths occurred in children under two years of age.† Fox and Knott‡ report that over 70 per cent of the deaths from whooping cough reported by the Milwaukee Health Department from 1933 to 1943 occurred in infants less than one year of age. About 16 per cent of newborn infants have no immunity to diphtheria.§ Since active immunization is usually not effective before six months because of the immaturity of the organism, it is extremely important to protect the young infant from any possible exposure to these diseases, either of which may have very serious complications.

Active immunization against whooping cough, diphtheria,

* McKhann and Kapnick^{234a} (p. 908).

† Brennemann^{52a} (Vol. 2, Chap. 34, p. 15).

‡ Fox, M. J., and Knott, E. M.: Whooping Cough Mortality. *J. Pediat.*, 24:671-674, 1944.

§ Brennemann^{52a} (Vol. 2, Chap. 4, p. 6).

tetanus and smallpox can be effectively produced between six and twelve months, and public health programs should make such immunizations possible for every infant.

Where such programs are in effect the drop in the incidence of these diseases is very striking. Garvin^{128a} compared the tables of incidence of whooping cough per 100,000 population among children under five years of age in two Ohio cities. In Cleveland where no whooping cough vaccination was offered by the department of health it was estimated that in this city with a population of 1,000,000 only ten per cent of susceptible children were being immunized. In Shaker Heights with a population of 25,000 it was estimated that 75 per cent of infants were immunized during a five-year period. In Cleveland during this period there was no drop in the rate of incidence of the disease, while in Shaker Heights the rate dropped progressively from 365 in 1934 to 182 in 1935, fifty-four in 1936, seventy-four in 1937, twenty-one in 1938 and forty-five in 1939. By such a radical reduction in the number of cases through immunization a department of health not only protects the children immunized but also does much to protect the very young infant, who cannot be immunized, from exposure to a disease which might easily be fatal to him.

It is common practice now for the physician to begin to immunize the baby against whooping cough when the infant is brought in for his six-months examination. At about nine months, injections of combined diphtheria and tetanus toxoid are begun, and vaccination against smallpox is given at some time between six and twelve months.

It is further recommended that the child be revaccinated against smallpox just before he enters school and every five to seven years thereafter. He should also be Schick tested at the time of school entrance, and if his immunity to diphtheria is no longer active, he should be given another injection of diphtheria toxoid. It is not known how long the early immunization against tetanus is effective, but it is recommended that a booster dose of tetanus toxoid be given to the child at any time following an accident, such as a deep cut or the puncture of a nail, which may have exposed him to a tetanus infection.

Recently two physicians^{156a} reported the successful immunization of a group of sixty-four children against diphtheria, tetanus and whooping cough with three injections of diphtheria and tetanus toxoids and phase I pertussis vaccine combined.

There have been recent reports of attempts,^{198a, 221a} by the active immunization of the pregnant mother, to produce passive immunity to whooping cough in the newborn and to lengthen his passive immunity to diphtheria. If such methods prove as successful as the early reports promise, infant mortality and morbidity from these diseases can be further reduced. There has also been some experimental work with very recent convalescent measles serum used intradermally as an active immunizing agent.^{44a}

Such experiments are indicative of the fact that the medical profession is alert to public health needs and continues to work to give every child his birthright of a safe healthy childhood. The fact that 1059 cases of diphtheria and forty-nine of smallpox^{282a} were reported in the United States in just one four-week period from December 30, 1944, to January 27, 1945, demonstrates that the public is not yet fully aware of its opportunities to protect itself against unnecessary morbidity and mortality and that it has not fully availed itself of these opportunities.

PROBLEMS FOR CLASS DISCUSSION

1. Ask each member of the class to choose some child, well known to the student, for study of his or her food intake. Ask each member to keep a record of the food eaten for four days, also the amounts, and to make a written report to the mother of the child on the basis of the record kept. Members of the class can read their recommendations to the class and discuss them in relation to the child's growth needs. They can also describe the physical condition of the child when the record was made and his or her behavior at the table and attitude toward the food. It will add interest to the class discussion if children at different age levels are selected. Let the students state the basis for their judgment of the child's health.

2. Let the class discuss the question of the physical and social consequences to this country "if one-third of the people in the United States are under-fed." Let the students define what is meant by "under-fed" and the reasons for people being "under-fed."

3. Have a panel discussion of the factors which contribute to the physical and mental health and happiness of the child under five years of age. Let the class discuss the case histories of children they have known intimately.

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Intellectual Growth

THE DEVELOPMENT OF MOTOR SKILLS

As the structure of the child's body matures, it acquires the ability to function in increasingly complex ways. Thus, along with his physical growth he achieves intellectual and personality maturings which change him from an uncoordinated, helpless infant into "a self-assured, conforming citizen in his small world"* at the age of five. This is a change which involves varied and complex developments, learnings in control of body and learnings about the things and people in his world—what they are and what they are for, what people expect of him and what he must do to get along with them. He must learn to understand and speak the language of these people in order to find his way about their world. And he must learn to temper his own feelings and desires to fit theirs if conflict is to be avoided and happiness to be found. This is a good deal to achieve in five years; it involves a lot of growing as well as a lot of conscious and unconscious learning.

The general sweep of this development in the first five years as well as a picture of some of the things which happen even before birth are shown by Dr. Arnold Gesell and his co-worker Dr. Frances Ilg.¹³⁶ These authorities have also given the following terse summary of this development:

"In the *first quarter* of the *first year*, the infant, having weathered the hazards of the neonatal period, gains control of his twelve oculomotor [pertaining to the movements of the eye] muscles.

"In the *second quarter* (16–28 weeks) he gains command of the muscles which support his head and move his arms. He reaches out for things.

"In the *third quarter* (28–40 weeks) he gains command of his trunk and hands. He sits. He grasps, transfers and manipulates objects.

"In the *fourth quarter* (40–52 weeks) he extends command to his legs and feet; to his forefingers and thumbs. He pokes and plucks.

"By the end of the *second year* he walks and runs; articulates words and phrases; acquires bowel and bladder control; attains a rudimentary sense of personal identity and of personal possession.

"At *three years* he speaks in sentences, using words as tools of thought; he

* Gesell and Ilg¹³⁶ (p. 64).

shows a positive propensity to understand his environment and to comply with cultural demands. He is no longer a mere infant.

"At four years he asks innumerable questions, perceives analogies, displays an active tendency to conceptualize and generalize. He is nearly self-dependent in routines of home life.

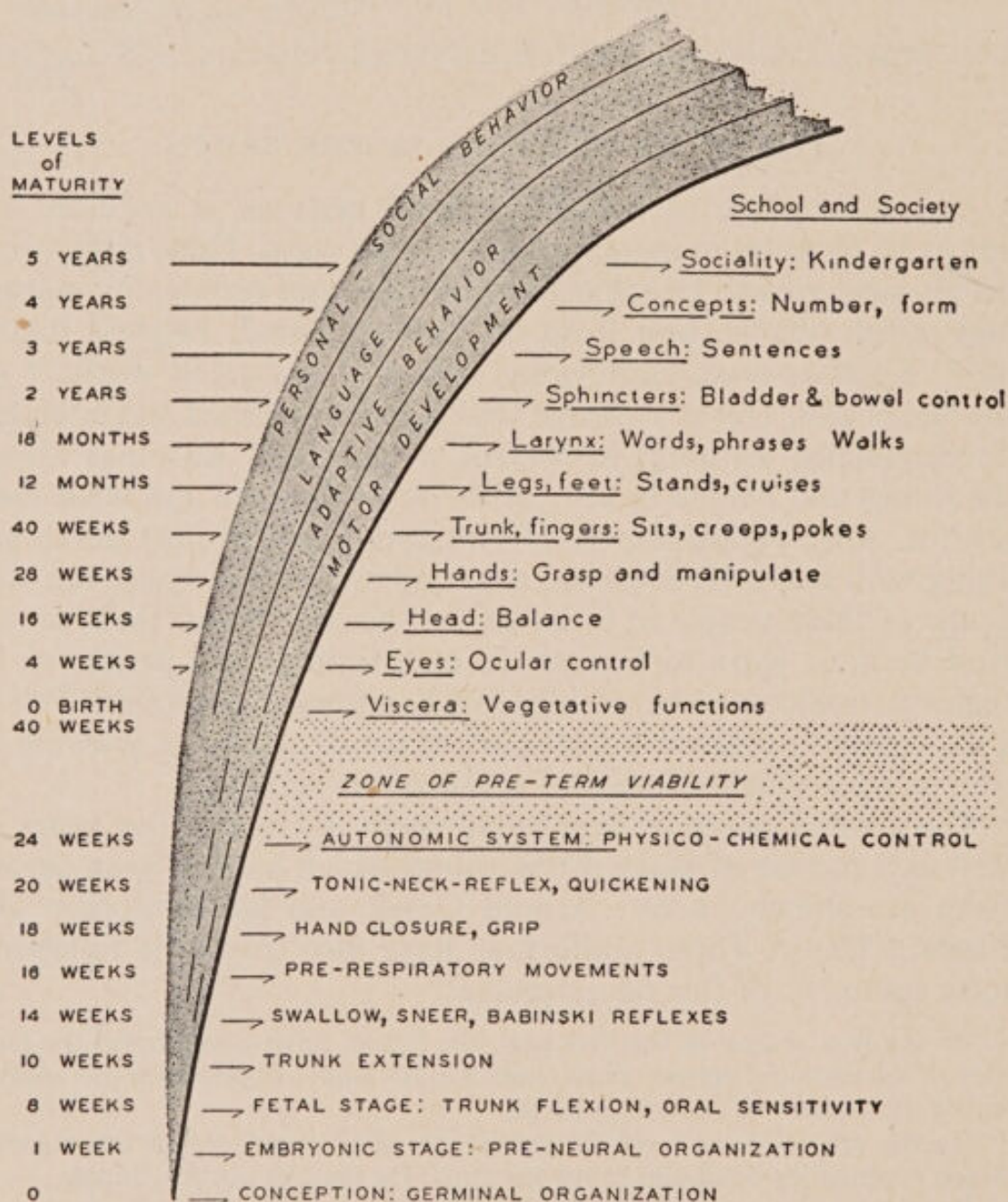


Fig. 35.—A diagrammatic representation of the trends and fields of behavior growth from the embryonic period through five years of age. (Gesell and Ilg: *Infant and Child in the Culture of Today*. Harper & Brothers, 1943, p. 63.)

"At five he is well matured in motor control. He hops and skips. He talks without infantile articulation. He can narrate a long tale. He prefers associative play. He feels socialized pride in clothes and accomplishment."*

* Gesell and Ilg¹³⁶ (p. 62ff.). (All brackets ours.) By permission of Harper & Brothers.

This summary is based upon the general expectation. No individual child achieves all of these steps of growth at exactly the ages indicated here. Some children will move at a pace faster than this in most areas of growth, others at a slower pace in most areas. Most children will be ahead of schedule in some areas while being behind schedule in other areas. As was said in Chapter I, this is the way children grow, and we should have less concern with measuring any given child against a schedule than with helping him to move smoothly along the various growth stages at his own pace.

Having discussed the growth and development of the essential structure (the body) we shall, for convenience, now divide our discussion of these growth stages into two general categories: intellectual; social and emotional. Under intellectual growth and development we shall consider control over the body in general, finer motor control, learning to use the organs of special sense (sight, hearing, taste, smell and touch), language, reasoning and imagination.

CONTROL OVER THE BODY IN GENERAL

The Simplest Mechanisms of Control.—*The Reflexes.*—As we have seen, any control the child achieves over his body must grow out of the structural and functional readiness of his body for each bit of learning. The most elementary type of control resides in the reflex capacity of the nerves and muscles (the neuromuscular mechanisms).

One of the most interesting things about a newborn baby is that he is a fairly efficient living machine. Until he is born, the child's breathing, eating and eliminating have been done for him by his mother's blood stream. At birth he suddenly comes into the need of doing these things for himself. The birth cry is usually given credit for inflating his lungs and introducing them to the task of respiration. A touch on the infant's lips sets up a sucking movement, a motor response which upon presentation of the mother's breast furnishes the infant with his food. Even though he does these organic things for himself, however, he is still entirely dependent upon others for his food supply and for his physical needs.

What he can do or can feel, of course, depends upon the development and efficient functioning of his central nervous system.

Current studies* give evidence that the lower (subcortical) centers of the brain which control reflex behavior are quite well developed at birth, but that the higher (cortical) centers do not function well for several months after birth. Reflex behavior, then, functions fairly well at birth, whereas sensory and voluntarily coordinated motor behavior do not function adequately until later.

A Number of Reflexes Present at Birth.—The newborn is well equipped with most of the simple neurological reflex patterns common to human beings at any age. He yawns, coughs, stretches, chokes, sneezes, swallows, hiccoughs, vomits, urinates, defecates and can execute the complicated behavior of sucking within a few hours after birth if not at once. A few infants need a little longer time before the sucking mechanism is perfected enough to obtain fluid from the mother's breast, especially if the nipple is resistant; therefore, patience is sometimes required during the first few days. Many mothers do not know this, and unless they are under the care of experienced people, may become panic stricken because the baby does not nurse vigorously at once.

The pupillary reflex and hunger contractions are also present. At least three reflex patterns which disappear later are present in most babies at birth. One of these is the *grasping* (or Darwinian) reflex by which the hand closes strongly upon stimulation of the palm. This is sometimes so strong at birth that the infant may support his entire weight in mid-air while hanging to a rod with one hand. This reflex is distinctly weakened (a sign of maturing) at the end of a month, and in most children it is gone by the fourth month—at about the time when purposeful reaching is established (see p. 271).

Another of these universal reflexes is the *Moro* reflex, named after the man who presented it in 1918. This is a reaction elicited by tapping on the abdomen, by insecurity of support and the like, in which the infant spreads his arms apart and then brings them together again in a bow, while the legs make a similar movement. This is similar to the "clamping instinct" described in zoological literature by which the young orangoutang clings to his mother while she is in motion. This reflex disappears at about three months of age.

A third reflex is present at birth and seems to disappear later. This is the *Babinski reflex*, an extension of the toes when the sole of the foot is stimulated. This gives place to the *plantar reflex* (a

* For excellent summaries of these see: Dewey⁹⁹ and McGraw.²³⁴

contraction of the toes when the sole of the foot is stimulated) which appears as the nerve centers mature.* The plantar reflex appears in the fourth month after birth in some children, and it is present in nearly all children by the eighteenth month. The fourth month is the month in which, for most children, the nerve centers involved develop (become myelinated or develop the myelin sheath). One cannot be too sure just when the toes begin to curl under instead of to extend when the sole of the foot is stimulated, since, as in most development the process of development is not smooth and does not perfect itself suddenly. There are rudimentary aspects of the plantar response which seem present even before birth according to some studies of fetal life. Yet the smooth, perfected reflex is not established unversally in children until about the eighteenth month.

A number of other reflexes have been observed in newborn infants but will not be discussed here since they are not as yet commonly described in the literature. It is interesting to note here that, with the disappearance of the Moro, the Babinski and the grasping reflexes, we see growth indicated by loss of functions which once existed. Thus we see that as the higher brain centers develop changes occur in the baby's behavior, some of which take the form of dimunition of primitive, reflex behavior. This is the converse of most growth, which takes the form of emergence and integration.

Learning through Success and Failure.—Motor accomplishments grow from the simplest beginnings in reflex action and in random and uncoordinated movement. The newborn infant promises little of the motor skill and bodily grace of the five-year-old child. During the first three months a good deal of general bodily movement takes place with stretching and waving of arms and legs. At this time, as well as later, freedom for such activity is essential and the clothing, although designed for protection, should permit as much freedom as possible. There should be certain periods (many mothers provide these at bath time) when the infant may stretch and kick entirely free of clothing, for it is only by practice that he can achieve strength and coordination. If we watch a tiny infant, we can see him experimenting with his body, gradually learning to isolate out of his random activity those movements which give him results. So by trial and error, with the right movements accompanied by the satisfaction of success, the wrong movements

* Richards and Irwin²⁹³ have studied these reflexes in infants.

resulting in failure, the child gradually learns the management of his own body.

Control Proceeds, Moving from Head to Foot and from the Center of the Body Outward.—Within the framework of wide individual differences of maturity rates, development in control of the body proceeds, moving, in general, from control of the head through the torso (or trunk) to the legs, and from control of the torso, at the center of the body outward through the arms and legs.* Even at the end of a month the baby begins to have rudimentary and uncertain control over his head and neck. By four to six months most children can hold the head up strongly and hence no longer need the support of the mother's hand as they are held. Placed on a hard table most children of four to six



Fig. 36.—Four to six months: holds up head and forward torso.

months can lift the upper part of their bodies and, by pulling their elbows under them, can stay up for several seconds at a time. Practically all children can do this by nine months of age. If not hampered by clothing the child growing at an average rate can usually turn himself over from stomach to back by five or six months. Sometimes, while lying on the floor on a blanket he may discover at six or seven months that he can propel himself by wriggling or hitching.

There are wide individual differences in all of these rates of motor development, however. Studies of fetal life²⁶⁴ show that babies differ in the rate of achieving motor developmental patterns

* An excellent review of motor growth and development can be found in the entire issue of *Review of Educational Research*, Vol. XIV, No. 5 (Dec.) 1944.

even in fetal life. There are clear individual differences in general impetus to motor activity as we shall see later, but it is interesting to note that these differences appear in the developmental picture even before birth. It has been found²⁹⁵ that the fetus which is more active in intrauterine (within the uterus) life is likely to be more advanced in behavior development as an infant.

At four or five months the average child can sit up for short intervals if sufficiently supported by pillows. Gesell¹³³ found that

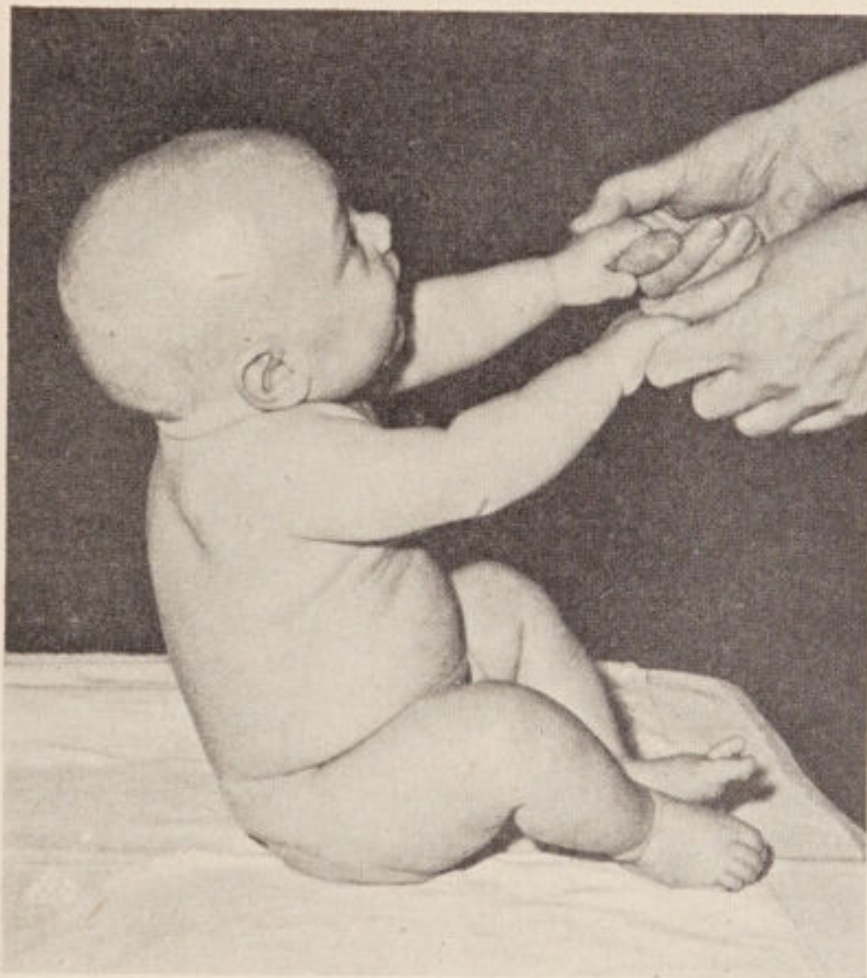


Fig. 37.—Four months: can pull up with help, but cannot sit up.

20 per cent of infants can sit with slight support of pillows or blanket at four months; at six months over half can sit in this way, and about 20 per cent can sit alone for some seconds. According to Gesell's norms, practically all normal children of nine months should be able to sit alone. Other studies have corroborated these findings so that, in general, we can expect a baby at six or seven months to sit with slight support, falling over only when he becomes tired or when his general wriggings or a desire

to reach something upset him. At six months he can make stepping movements if held under the arms; at eight or nine months he has usually learned some technique or other which serves to get him from one place to another with ease. Sometimes he travels on all fours, sometimes sits and hitches himself along with his heels, sometimes scoots along on one hip using two hands and the opposite foot for propellers. Probably the creeping methods he adopts is determined by the way he first happens to establish locomotion in his wriggings.

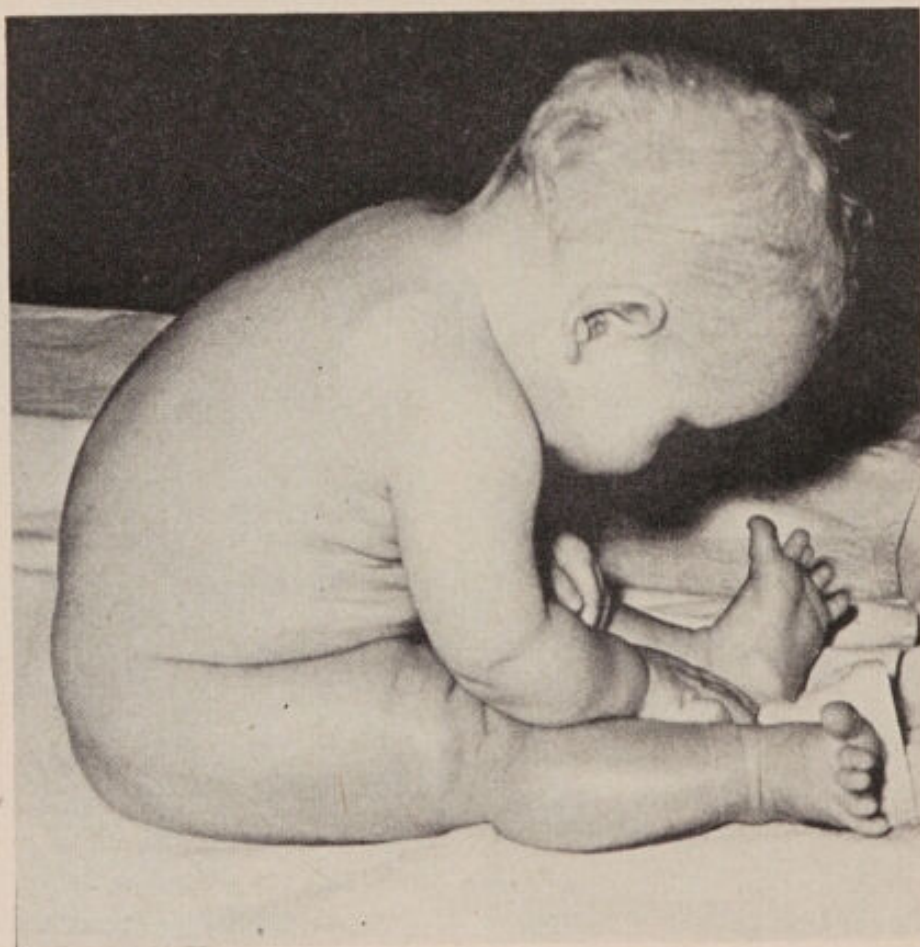


Fig. 38.—Six to eight months: sitting is still wobbly.

Standing with support appears in most children at eight to ten months and is fully developed by twelve months. Standing without support is fairly frequent in children of twelve months and almost universal by eighteen months. However, around ten per cent of children²²³ stand with help at six months, and around 40 per cent stand without help at nine months. An average age for standing alone has been given by Bayley²⁷ of the University of California as twelve and one-half months.

Vigorous General Bodily Activity Characteristic of One-Year-Old Children.—The period from nine to eighteen months is one of rapidly increasing facility in locomotion. All investigators agree that this is a time in which the child learns to creep, to pull himself up by chairs, to climb, to walk and to control his body as a whole. Rapidly developing children are constantly on the move and may even climb stairs in the creeping position by twelve to fifteen months. Occasional children of fifteen months and many children of eighteen months climb stairs with the aid of a banister, one step at a time and on all fours much as puppies do. They come down stairs, again with the aid of a banister, by dropping to a sitting posture on each stair, wriggling to the edge, standing on the next stair below, dropping down and so on. If given sufficient opportunity for practice on stairs that do not offer too great hazard, many children of eighteen months can ascend and descend stairs in an upright position with the aid of a banister.

With all the experimenting in general bodily movement characteristic of this age, it is interesting to note that dropping from a standing to a sitting position takes almost as much, if not as much, learning as pulling up from a sitting to a standing position. Most children, however, have achieved both skills by the time they are a year old. The proportion of the body, the short legs and longer trunk, tend to make the movements clumsy, and it requires a long period of experimenting until the child can adjust the center of gravity of his body so that he can stand and move with the assurance of not falling.

Walking Is a Complex Accomplishment.—The ease and assurance with which most children learn to walk gives the casual observer no indication of the complex learning that it represents. "Guiding the body through ordinary movements of everyday life is one of the most intricate accomplishments of the human organism. With every change in position or velocity of any part of the body, forces acting on the system change and must be matched with changing muscle tensions if the desired movement is to eventuate. Analysis of locomotion must consequently deal not only with changes in position of the parts of the body, but also with changes in the forces, both external and muscular which accompany them."*

These controls and adjustments require maturing structure and function of muscles and of the neuromuscular mechanism, such

* Elftman^{106a} (p. 1427).



Fig. 39.—Ten to twelve months: creeping is now easy.

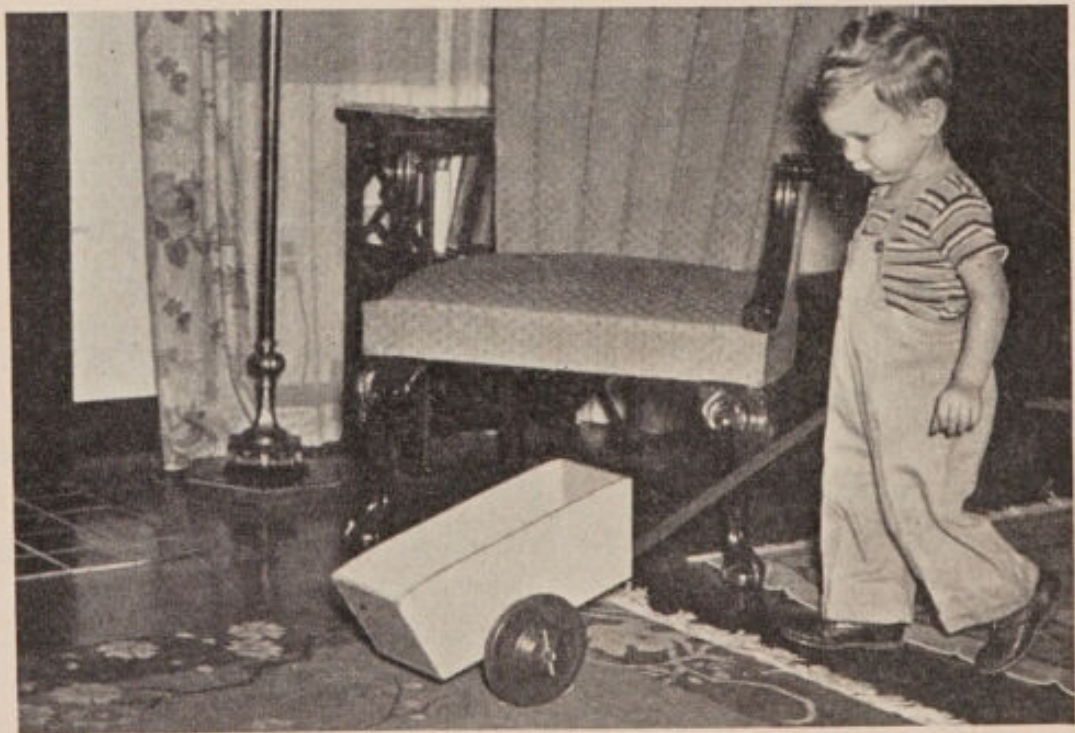


Fig. 40.—Twenty to twenty-four months: walking is for most children sufficiently under control to permit pushing of a toy.

as maturing control over the function of seeing as well as the machinery of body balance and steering. Both skills are needed since the child must learn not only to place one foot after another;

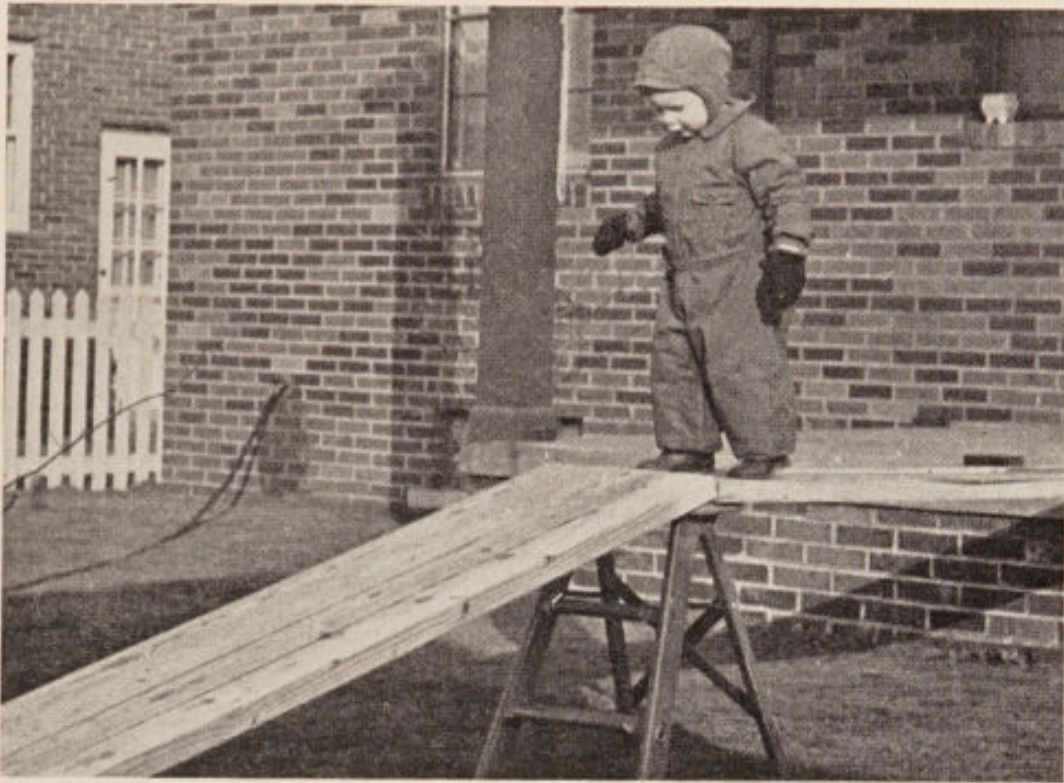


Fig. 41.—Around two years tests of balance are fun.



Fig. 42.—Two and one-half years: walking skills and body balance are becoming unconscious enough to permit concentration on a game.

he must also see where he is going and learn to steer around or go directly to objects in his environment.

For this reason walking as a mature skill is developed over a considerable number of months of chronological age. In a sense, the coordinations of the body revealed when the child splashes in his bath around three to five months of age, when he holds up his head, accomplishes the sitting posture or pulls himself up by the side of his crib or play pen are all phases of learning to walk.



Fig. 43.—Three to four years: large muscle skills are now unconscious enough to permit many variations in play.

Much of the literature rests content with setting an average birthday age at which children on the whole take their first steps without help. This they do at anything from eight or nine to eighteen months, depending upon the child's individual rate of gross motor (total body) development. The "average age" of walking is cited by many writers at somewhere around thirteen or fourteen months, although many children walk before then, and many others do not walk until fifteen or sixteen months. Most children have taken independent steps by eighteen months of age.

Preliminary stages of locomotion, however, extend back before creeping and crawling, as far as the prenatal beginnings in motor control. Similarly, the real accomplishments of upright locomotion extend for years beyond the first independent steps. These steps of growth progress through all the increasing stages of awkward toddle, flatfooted paddling about, stumbling running, labored stair climbing, timid balancing along low inclined boards and other increasingly complicated adjustments of the body in locomotion. The mature or 100 per cent accomplishment of the walking skill is arrived at when the child walks and runs with grace and ease, and when he unconsciously adjusts to and swings around obstacles in his path. A few children have achieved this by two and one-half years of chronological age; many children have it by three to four years; most children have it by five years of age.

In quick *summary* the maturity stages of walking may be viewed as follows:

1. Raises head.
2. Turns over.
3. Sits up with support; without support.
4. Stands with support; without support.
5. Takes steps or walks with support.
6. Walks without support; the first independent steps. At this stage movement is awkward, and the child cannot steer around objects in his path.
7. Walks well enough to clear obstacles, but is still consciously aware of adjusting to them. Unless he attends to what he is doing, he bumps or falls.
8. Can move in any direction and adapt unconsciously to obstacles of varying height. Shows no hesitation or need of special attention in skirting objects or climbing over them.

Crawling and creeping are accessory to the main pattern of development. Most children go through them as a stage on the way to the walking maturity; but some children do not. They do not seem to be necessary stages along the way.

Other skills, such as increasing speed of walking and running, or development of balance, or increases in strength and endurance, are perhaps "embroidery" on the basic developmental pattern of walking; or they may be separate, basic developmental patterns. We do not yet know. When we find out, the answer may affect educational practice.

Step 8 of the above series of maturity stages is the adult (100 per cent) maturity stage of the walking skill. Most children have arrived at this stage by five years of chronological age. There are,

however, wide ranges of individual difference at every stage. Some children adopt one channel of development, some another (Fig. 44).

Some Factors Other Than Maturation Involved in Learning to Walk.—Walking, as we have said, is a complex learning process. It is dependent upon many inner maturational factors, and its perfection takes many months. However, parents have come to

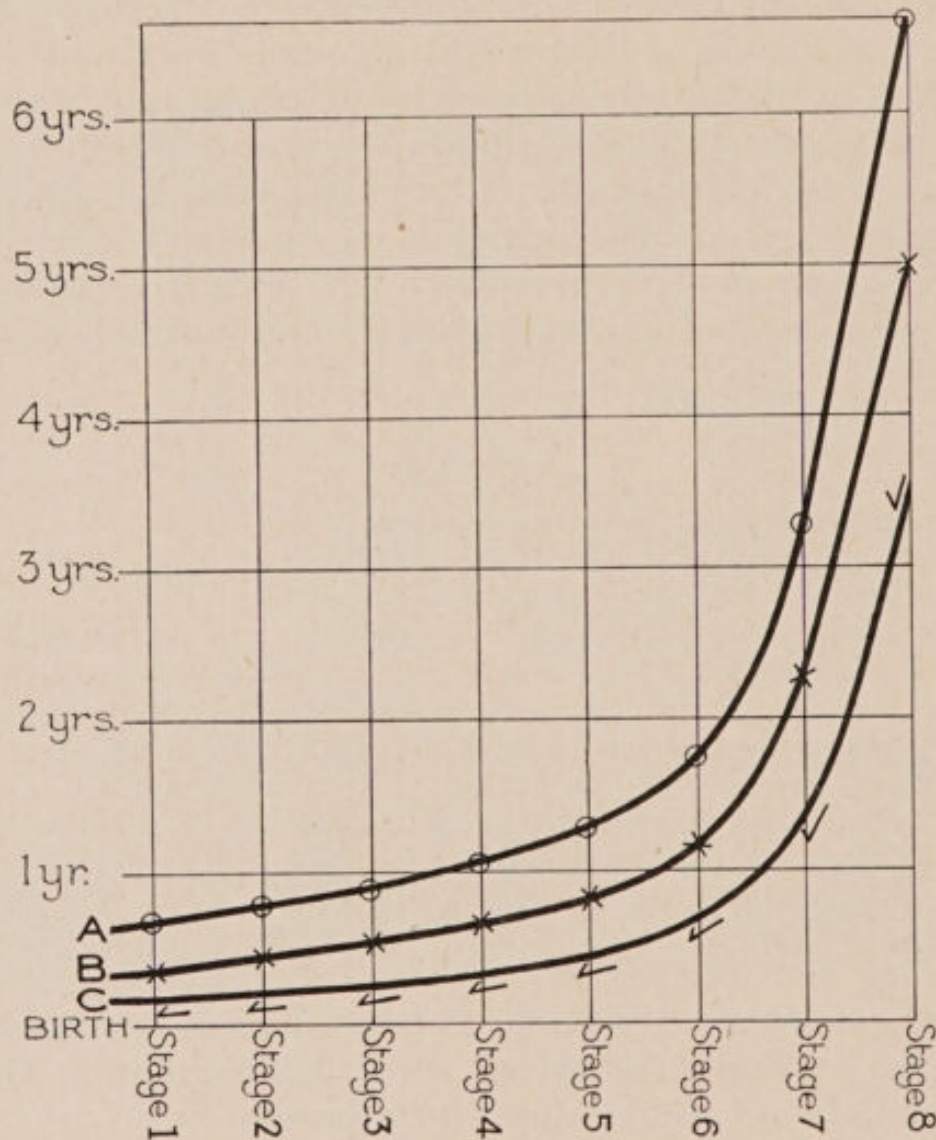


Fig. 44.—Possible channels of development of walking stages.

look upon the child's first independent steps as the important test of a child's motor development, and often worry about whether or not there is anything they can do to help their children achieve this skill. One thing they can do is to offer the child plenty of free opportunity to be as active in general bodily movement as he wishes to be. We have as yet no way of measuring the training in muscular coordination that comes to young children through

climbing up and down steps, over large boxes and pushing loaded wagons. It is not uncommon, however, to observe in children a certain lack of skill in handling their bodies, a certain sense of physical instability which results from not having had an opportunity to perform these movements.

A case in point is that of Edward. When Edward came into the nursery school at twenty-five months of age, he had lived all his life in the second floor of a duplex apartment. There had been no yard or outdoor play space, and he had been carried up and down the steps into the apartment. When out on the street he was either wheeled by his mother in his "go-cart" or led by the hand for a few blocks. Upon entering the nursery school he had had no experience in the coordination of his body in climbing stairs, mounting the jungle gym or climbing on and off a tricycle. All these movements had to be learned. It was several months before he could mount without apparent concern the small ladder by which children climbed to the measuring board in the physical growth laboratory and which most children mounted easily and eagerly. So far as one could judge it was not fear of falling but an inability to induce muscular coordination. That his environment was responsible for this condition was proved by his prompt response to opportunity to use play equipment and the subsequent disappearance of his awkwardness, lack of balance and sense of physical inadequacy.

Parents can not only see that the child has *opportunity to practice the motor skills*; they can also see if his muscles lack tone, or if he suffers from *rickets*, since, if he has either of these defects he cannot be expected to support himself in an upright position as soon as a normal child would. If he has been or is ill, he probably lacks the necessary muscular strength for walking which, being a new and unaccustomed activity, demands great strength and energy. *Illness* handicaps him also because it curbs his interest in activity and thus deprives him of even the amount of practice his small physical strength might endure.

Parents can see that the child has plenty of *space* which is not too slippery or too drafty or too dirty to permit freedom for practice. He should have the larger part of some room in the home, the floor of which is protected from drafts and if possible equipped with linoleum which can be kept clean but which is not too slippery.

Clothing and *shoes* are important, too, since the child must not be hampered by dresses which upset him when he tries to stand, or by shoes that are too small or too soft. He should wear the minimum amount of clothing permitted by the weather. Overalls which fit closely enough to keep out of his way conserve laundry. Shoes with a firm enough sole to support his feet, as well as to keep

him from wearing blisters on his feet, are helpful. Corset shoes (high shoes with corset steels to support the ankles) are neither necessary nor desirable since full play of the muscles is essential to strengthen the feet. Lace oxfords are to be preferred unless high shoes become desirable for warmth in winter or for support of an overweight child. Button shoes or slippers with button strap do not offer enough support because they cannot be adjusted daily to the child's foot and leg.

Not many years ago it was thought that every child who delayed walking beyond the twentieth to twenty-fourth month would turn out to be feebleminded. The chief reason we worried about his slowness was not that he might be physically or emotionally inadequate, but that he might be intellectually inferior. But having followed children who were late in walking we now know that they often turn out to be normal or even superior in *intelligence*. Gifted children do not walk earlier than do ordinary children.⁹⁸ Although special training or advanced intelligence do not appear to produce or to be associated with early first walking, certain deprivations such as lack of opportunity to practice operate to retard walking.⁹⁸

Certain emotional factors are also of importance in determining the speed with which children learn to walk. Severe accidents may produce fear and timidity. Too great anxiety on the part of adults over casual bumps may convince a timid child that he takes too great a risk in trying to walk. Too great enthusiasm over his first attempts may inhibit a self-conscious child, or too ready laughter at the "cuteness" of his gait may take on an aspect of ridicule. If the parents become overanxious because he does not walk, the feeling of anxiety soon conveys to the child, attaching excessive importance to his learning and making him too afraid of failure.

Again, some children have no *motive* for walking or locomotion of any kind, and this may prove sufficient to delay the effort, especially if they have not discovered the thrill of movement for its own sake. It is a good idea to let the six- or eight-months-old baby struggle a bit when he has let his rattle drop only a few inches from him. The thrill of recovery will attach satisfaction to his efforts and encourage him to make a greater effort the next time. Give a nine- to twelve-months-old baby a ball to play with. The urge to pursue it will provide him with a real motive for practice in locomotion. In fact, as was emphasized earlier, balls of varying

sizes and weights provide an unexcelled type of "teaching toy" from a few months of age through the entire period of childhood. Not all of the child's wants that can be obtained through his own locomotion should be met for him by adults, since to meet them all for him is to rob him of a natural motive for motor practice. It also deprives him of the natural satisfaction which is one of his most powerful rewards for activity. Thus, in meeting some of his own wants the child may learn the joy of activity for its own sake which will serve him well as a habit of health in later years. Other children to play with provide natural circumstances which encourage activity and are from an early age as important for this



Fig. 45.—The ball is lost under the davenport. Plenty of reason for locomotion results.

reason as for the reason that they give stimulus to social development.

We should remember, too, in this connection that walking, like all other motor and verbal skills, may suffer an apparent setback because of illness or because of a diversion of attention to some other activity. All development is dynamic. It seldom flows smoothly and continuously. Children often seem to have learned to do something and then to forget it. This is because, although the first learning has been accomplished, attention may be turned elsewhere before the motor habits have been well set, and the child seems to forget for a time what he had learned.* When attention

* For further development of this idea see Chapter XI.

returns, however, we find that he has not entirely forgotten, but soon "brushes up" the learning and goes on with the fixing of the skill habits.

Other Bodily Skills.—As the walking skill becomes smoother and as grace develops, other general bodily skills are also maturing. A number of variations are tried out, like running on tiptoe, standing on one foot, whirling to make oneself dizzy and then trying to walk, hopping, skipping, jumping and so on. These, along with learning to ride a kiddie car, a tricycle, a two-wheeled scooter and finally a bicycle all follow as refinements on upright locomotion and general body balance.* Hopping, jumping over low obstacles and standing on one leg are all accomplished by most children before five or six years of age if normal opportunity for practice is allowed. Galloping is a skill not seen in three-year-olds;¹⁵⁴ but many four-year-olds practice it; many five-year-olds can do it; but not until nearly seven can most children really do it skillfully. Skipping is still later in development for most children. Three-year-olds are usually facile on tricycles and often use two-wheeled scooters with skill. Four-year-olds usually love to push and turn wagons, and to operate complicated foot-operated automobiles and airplanes. Five-year-olds sometimes roller skate fairly well, and occasionally four-year-olds manage to do it. However, in any fairly large group of six-year-old children some will be found who cannot hop or skip or jump at all. There will also be found some children who can do all of these things, and who can also roller skate, turn cart wheels and ride a bicycle with smooth excellence.†

Development of Courage or Timidity a By-Product of Motor Learnings.—If we regard the degree of satisfaction accompanying an act as evidence of the innate character of that act, we can scarcely dispute the innateness of the urge toward locomotion, at least in most children. The thrill of accomplishment which accompanies each new bit of learning seems genuine, as the child throws back his head to crow his delight or abandons himself to an orgy of practicing his new achievement. The number and severity of bumps that some children take without complaint or discouragement in the process of learning upright locomotion seem proof of

* Gutteridge¹⁵⁴ gives an excellent summary of the development of these skills.

† For further discussion of motor skills at age five and during the later years see: Breckenridge and Vincent.⁵²

intense absorption. We miss an excellent opportunity to teach physical courage if we curb his freedom or seem too concerned over his bumps during this absorbing learning period. If he is genuinely hurt in a fall, however, he should have sympathy and care, since real terror sometimes accompanies loss of balance and severe pain.

DEVELOPMENT OF THE FINER MOTOR SKILLS

Learning to See.—The baby learns the muscular movements necessary to vision (accommodation and convergence) by much the same trial and error process as he learns other motor skills. At two months he has learned to adjust and hold his eye muscles so that he can see large objects. He “notices” the approach of a person, a change from one room to another and so on. At four months he sees with much clearer discrimination but is still not likely to notice an inch cube placed before him. At six months he sees very small objects and by eight or nine months he not only sees them, but has achieved sufficiently good eye-hand coordination to pick them up. It is at this stage that his joy in the exercise of his new accomplishment often produces a fascination for pins and specks of dust, which distresses his mother. As control over the function of vision develops the child is enabled, as we saw earlier, to see objects in his environment around which he must steer in walking. His ability to see people is prerequisite to many of his social reactions. In the realm of fine motor skills, seeing is prerequisite to reaching and grasping, since eye-hand coordination is the basis upon which his eye locates what his hand eventually learns to reach for and obtain.

Learning to Use Thumb and Fingers.—Growth in the use of the thumb and fingers is extremely significant during the baby’s first months. At birth the hand, though strong enough in the reflex grip to maintain the body weight, is useless as a vehicle of the will. The thumb lies flaccid and helpless in the palm, or fans about uselessly. However, the hand, especially the fingers, soon becomes useful as an aid to producing sensations. The fingers of the two hands come together, touching, exploring each other as early as one month after birth. The thumb gains strength and individuality and functions in opposition to the fingers in grasping at from six to nine months. Picking up an inch cube with the “palmar scoop” (an awkward scoop with the whole hand) is the characteristic approach at four months. The same technic is used on a small

sugar pellet by 50 per cent of babies at six months, according to Gesell.¹³³ By eight to nine months, however, the fingers and thumb work in opposition to each other to make the pincer technic of picking up and holding objects effective (Fig. 46). By one year, looking at such a small object and picking it up skillfully with the fingers and thumb have become one smooth, coordinated activity. The greatly increased efficiency of the hand as an organ for grasping when the thumb is in opposition can be seen if the reader will

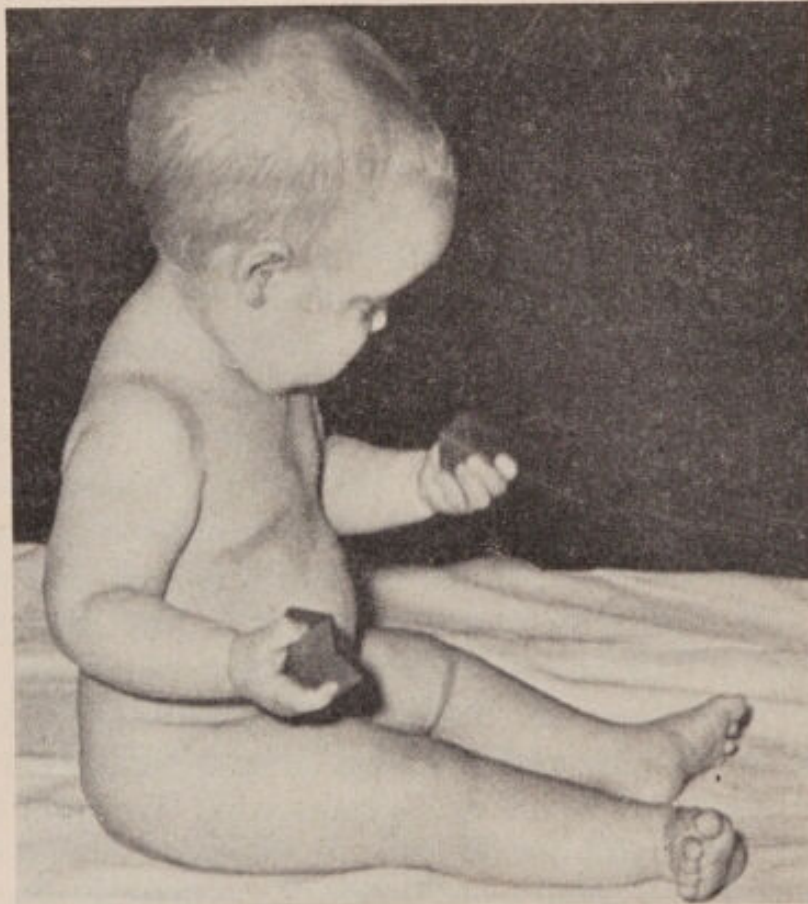


Fig. 46.—Sitting with ease at nine months, this baby has secured three cubes (a superior performance in grasping) and holds them with clear thumb-finger or pincer grasp.

try closing the thumb into the palm of his hand before grasping an object, and will then release the thumb so that it can oppose the fingers as is normal in adult grasping or picking up of objects.

Reaching and Grasping.—Castner⁷⁰ as early as 1932 called attention to the coordination of visual and neuromuscular components in the development of fine prehension (the act of seizing or grasping) in infants. McGraw,²³³ in a study of seventy-three children ranging in ages from birth to four years, concludes that reaching-

prehensile (seizing or grasping) behavior from the onset of its development represents a function which requires an interconnection between visual and neuromuscular mechanisms. This would mean that reaching and grasping at all stages is dependent upon connections between the hand's ability to grasp and the eye's ability to see. McGraw has traced six phases of the development of reaching-prehensile behavior as follows:

(A) In the newborn or passive phase, there is random waving of hands and reflex grasping but no connection between the visual and neuromuscular movements educed.

(B) In the object-vision phase, the child begins to fix his eyes upon objects within near visual range, and shows neuromuscular tension or diffuse activity.

(C) In the visual-motor phase, the eyes fix on the object and neuromuscular activity occurs, but the movements are purposeless and seem in no way connected with a desire on the part of the child to possess or manipulate the object.

(D) In the manipulative and deliberative phase, the child shows sustained attention to the object and can reach effectively for it as long as he gives undivided attention to it, but reaching movements are interrupted if he takes his gaze from the object.

(E) In the visual release phase, sustained attention is no longer necessary in order to carry out effective reaching; by one brief look the child is able to direct the movements of his hands for effective grasping, although he still may show some unnecessary movements in the process.

(F) In the mature phase, both the visual and neuromuscular aspects of the performance are reduced to the minimum requirements.

Figure 47 shows the ages in days at which each of these phases develops. We can see that phase A was near completion for the group at around 130 days (four months). The final phase began for a few children as early as 450 days (about fifteen months), but was not completed for 100 per cent of the group until around 1250 days (about three and one half years). This gives us some idea of the wide range of maturity levels present in this, as in the development of most traits. McGraw points out in this study the relation between function of an organism and its structural maturing. She says (p. 139, *ibid*), "There is no structural evidence that the cortex of the newborn infant is functioning to any appreciable degree. The onset of object-vision [McGraw's Phase B] as indicated by

pursuit movements, convergence, and distance accommodation reveals functioning of the visual cortex." When this behavior ap-

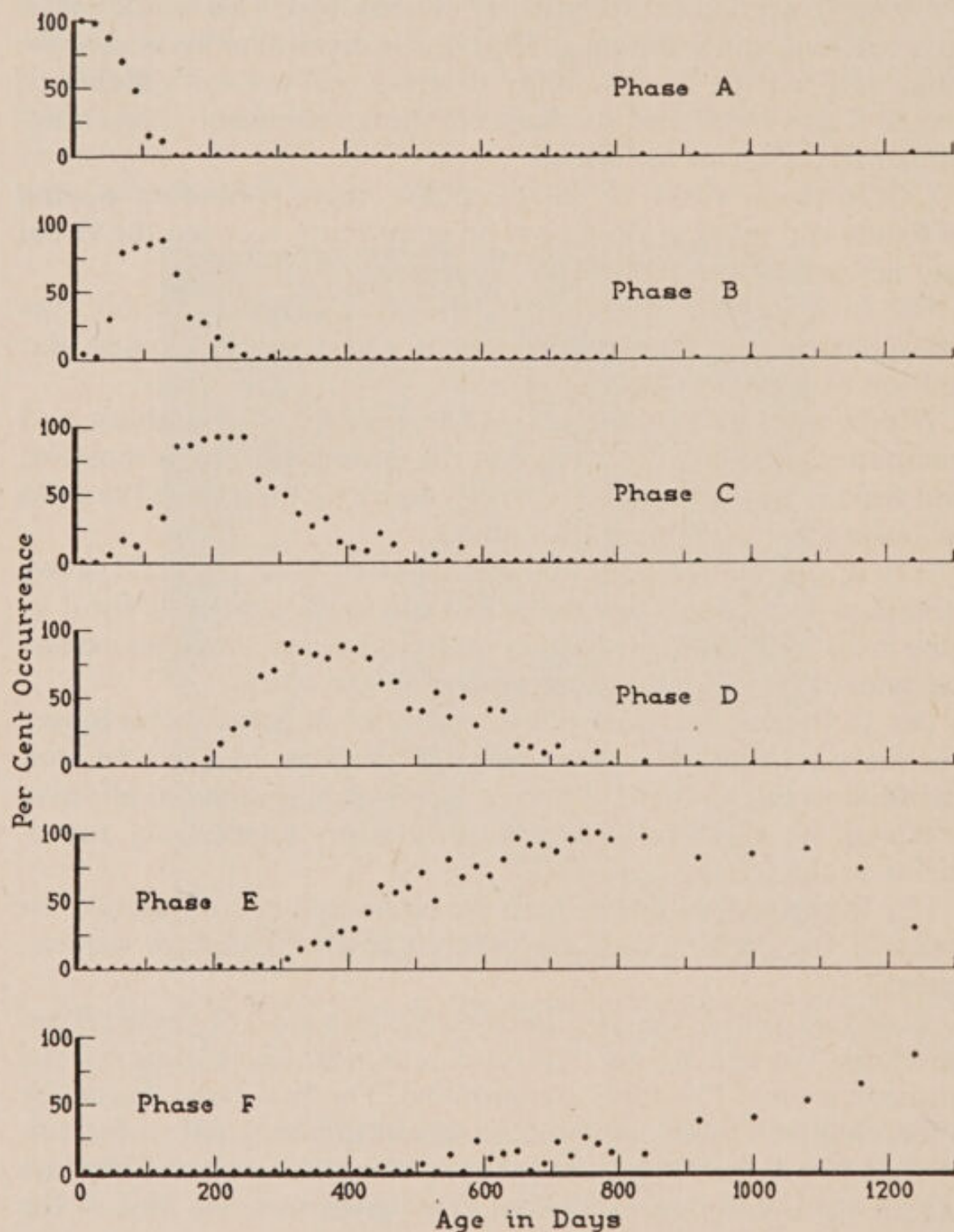


Fig. 47.—Curves showing the percentage of occurrence of each phase of the reaching-prehensile behavior as manifested by the group. (McGraw: *Journal of Psychology*, Vol. 11, 1941, The Journal Press.)

pears, in other words, we can know that the structural maturing is occurring or has occurred. When purposeful, directed reaching and

grasping occur, we know that both visual and neuromuscular brain centers are reaching or have reached functional maturity.

Another maturational series for reaching and grasping has been described by Shirley³²⁴ as follows: reaching and missing, reaching and touching, grasping and not holding, grasping and retaining, holding and manipulating, and holding and manipulating with one hand. Shirley found that most of this learning takes place between three and nine months, the process being complete for normal children at nine months. It is difficult to compare these stages with those of McGraw, since the approach to the analysis in each instance was made from a different point of view. Gesell¹³⁶ finds that at five months the baby's hands close in on an object, corral it and grasp it on contact. By nine months he can grasp objects, transfer them from one hand to another and manipulate them in simple ways. By one year he has command over his separate fingers to the extent that he can "poke and pluck." At one year, too, he learns not only how to take hold of objects but also, and this is the more difficult lesson, how to let go of them as well (see below).

Gesell has an interesting test to show the child's adaptation to materials which interest him. If we present a child of less than six months with a small wooden cube and then with a second, he is more than likely to drop the first in order to take the second. At four months he usually reaches incipiently with both hands, his whole body as well as both hands participating in his eagerness. Such reaching is not as a rule effective; but soon the reaching becomes more nearly narrowed to the use of the two hands and becomes more efficient. At six to nine months the greater efficacy of reaching for objects with one hand has been learned, and as is characteristic of new learnings the child seems unaware for the moment of other possibilities; so he uses only one hand, dropping one prized object for another. He learns quickly, however. By nine months he uses each hand with enough independence from the other that he can retain the first cube while he reaches for the second (Fig. 46). Three cubes, though, are too much for the average baby; he drops one or both of the first two to gain a third. At twelve months he is equal to three, occasionally reaching for the third with his mouth, and at eighteen months he can accept a fourth or even a fifth without losing those he already possesses.

Learning to Let Go of Objects.—It is interesting to note in connection with use of the hands that learning to let go of objects is almost as difficult as learning to take hold of them. We can see

this if we watch a fifteen- to eighteen-months-old child learning to throw a ball. At first he is almost sure to let go of it at the wrong time, dropping it behind him or flinging it straight up in the air. He usually takes several trials to learn just when to let go in order to make an effective throw. This letting go of a ball is, however, a much more complicated development than the simple letting go of a cube into a cup or the dropping of a rattle. Early in the "letting go" series of developmental stages is the dropping of objects because the infant has not yet learned voluntary control of the taking-hold and letting-go muscles. He drops the object because his attention and his muscular energy go elsewhere. By six or eight months, however, the letting go is purposeful to the extent that it often becomes a favorite game to throw a rattle or other object on the floor for the sheer fun of seeing someone pick it up and hand it back. Letting go of a ball in order to throw it in a given direction is several growth stages in development beyond this. It involves an ability to judge the direction in which the ball is to go and to sense when the arm is in position to give the ball impetus in that direction. It also necessitates body balance sufficient to stay upright in the process of shifting the weight in order to throw, and, finally, a synthesis of all of the necessary sensations into a whole which will signal the higher motor control centers in the brain to release the ball at just the proper instant. Thus we have a series of maturity indicators which when present, tell us when it is time to start playing a simple tossing game of ball with the child.

Hand-Mouth Coordination.—Learning to put the hand into the mouth is often one of the earliest voluntary coordinations accomplished. The mucous membrane on the lips of the newborn infant is different in texture and cell layers from that of the child who has matured to the point where he can eat semisolid and solid foods. In the first year, before this change of structure has occurred, the child's method of getting food by sucking is made efficient by the immature structure which is often referred to as the sucking pad. As the sucking pad gives way to the form of tissue adapted to more mature ways of getting food, we see the development of the hand-mouth coordination for purposes of getting food by the hand method rather than by the sucking method.

Before this purposeful hand-mouth coordination develops, however, we often see an irrelevant hand-mouth reaction in which the infant's fist gets into his mouth to be used as a sucking object. This is an immature pattern of the hand-mouth coordination which, as

the child's purposeful food-getting hand-mouth coordination develops, yields to the more mature form. Thumbsucking, along with all other forms of purposeless or accessory hand-mouth habits, is an irrelevant pattern which serves no constructive purpose. In the course of normal growth it tends to drop away as the purposeful pattern develops. Hand-mouth coordination as a means of food-getting reaches its 100 per cent maturity level when the child becomes proficient in feeding himself.

There appears to be one other form of hand-mouth coordination besides food-getting that may be relevant to growth in our culture. This is the use of the mouth as an exploratory organ. The tongue and lips are acutely sensitive touch organs, and children of six to nine months are likely to use them in order to explore everything that they can get in their hands. The baby's impulse to explore objects with his mouth is part of his gluttony for experience which increases his knowledge of the many objects that come within his reach. Because of this tendency to put everything into his mouth, he should be provided with some place to play which offers him freedom, yet protection. A kiddie koop, large enough to permit real freedom of movement but capable of restricting the territory of this young gourmand, offers the opportunity for unsupervised but safe play which is essential even in the first year of life. Of course there should also be times when he can travel at large and exercise his body to its full capacity.

The baby must not only learn to carry his hand to his mouth but a little later he must learn to keep his hand (and objects that come into his hand) out of his mouth. This learning not to put everything into his mouth is called hand-mouth inhibition. In most children hand-mouth coordination is judged to have begun at around four months, to be dominant at six months, on the wane at nine months and inhibited at twelve months. However, this is the irrelevant type of hand-mouth coordination and the pattern of waning of the immature pattern. Purposeful, food-getting hand-mouth coordination does not begin until around a year (the time when the immature pattern has waned) and continues in development until nearly three years, the age at which most children have arrived at smooth hand-mouth food-getting.

Increasing Skill with Hands Important to Growth of Intellect.—Increasing skill with hands permits the child a greatly enlarged capacity for getting into contact with the world. He also is able to feed his mind with a manifold of sensations which he gains from

his new world through exploration and manipulation with his hands. At six months the child has learned to use his thumb in opposition to his fingers in grasping, but he has not yet, as was said earlier, discovered the advantage of a pincer technic in picking up objects. At nine months, however, he has learned the advantage of approaching the object with his fingers and thumb, and can usually pick up small objects between thumb and fingers or approach a small dish by placing his thumb and fingers over the edge. At twelve months he is fairly skillful in the manipulation of objects and can place a cube in a cup, a cup on a saucer or one small tray on top of another with comparative ease. In fact, the use of objects, one in relation to the other, as cup on saucer or spoon beside plate, is usually begun at this age. This is the stage of hand control which, if other maturings are occurring as needed, is the stage when most children reach for the spoon during feeding time and thus begin the process of learning to feed themselves.

Hand Preference.—The question of preference in use of hands arises here, since a good deal of our encouragement of the use of one hand or the other should depend upon whether or not the child naturally shows preference for right or left and upon whether or not a forced change is injurious. We do not as yet have enough studies to establish at what age preference, if any, should appear. One thing, however, is indisputably clear. Hand dominance is inherent in the structure of the nervous system. The majority of people are right-handed in the sense that the use of the right hand is easier and permits of much greater skill than the use of the left hand. However, a certain proportion of people are natively left-handed and cannot be taught to use the right hand with the skill and ease which is native to their left hands. The figures on how many people are natively left-handed range from 4 to 15 or 20 per cent, depending upon the degree of dominance used as a standard by the particular investigation.

The exact time to decide whether any given child is natively right or left-handed is not clear. A child may have a brief or long period when he seems to use either hand with equal frequency and ease (the ambidexterous period). Some children show definite preference as early as six months, but most children are twelve to fifteen months old before preference is clearly evident. If the child is not markedly left-handed, but seems as late as fifteen or eighteen months to use either hand with equal or nearly equal ease, much can be done to encourage the use of the right hand by giving him

things toward his right hand. However, insistence upon the use of the right hand, if the child seems persistently more awkward with the right and more skillful with the left hand, is unwise, especially if encouragement of the use of the right hand meets with emotional resistance from the child. Reference to the matter of handedness is made again on page 321 in connection with the development of speech.

Skill in manipulation of objects moves forward rapidly from one to two years of age. Combined with the rapid development of up-



Fig. 48.—This child, clearly left-handed, is very skilful in the use of his hands at two years. Note “duck squat” peculiar to two-year-old children. Note, also, the purposeless, accompanying activity of the unused hand. This is characteristic of one stage of hand control.

right locomotion, especially of climbing and running, and associated with a rapidly growing curiosity about things, it produces a behavior problem in many families. The insistent getting into things, the constant handling of everything in the environment sometimes causes sharp conflict between parent and child, as we shall see later. However, the developing skills with hands offers something of a solution, since it permits certain “busy work” with crayons, scissors, blocks, clay and so on. Children cannot be expected to spend long periods of time seated at this sort of activity,

but it does offer some help in the directing of what might otherwise turn out to be rather destructive energy. Let us see what hand skills we can expect from two to five-year-old children.

At two years most children can scribble, cut gashes in paper with scissors, string fairly small beads with a coarse needle and heavy thread, pile four or five blocks into a tower and use a fork and spoon, though with a good deal of spilling. A few children at two become interested in helping to dress themselves. However, Armstrong and Wagoner,¹⁷ who studied the motor control of children in dressing themselves, report that at two years of age their children were largely disinterested and indifferent to the activity of buttoning up jackets and seemed not to have the motor control required to manipulate the buttons. Less than half of Gesell's children could put on their own shoes at twenty-four months.

At three years, however, if they have been given opportunity to learn, most children can do many "self-care" and other motor activities. They can copy a circle with a pencil, close the fist and wiggle the thumb (so great has control of the thumb become), build a high tower with blocks, build simple block houses, set a low table neatly if told what to put on it, carry a tray containing a plate or bowl, feed themselves neatly with a fork, wipe up spilled things without aid, dust, help care for a pet animal, and wipe a number of dishes. They also can wash themselves efficiently, turning the water into the bowl, soaping backs and fronts of hands, using a wash cloth for the face, and wring it out and hang it up on their own hook. They can manage the front buttons of clothing at the toilet and can undress themselves with the exception of difficult buttons and fastenings, can hang up their own clothing neatly and can place shoes under the bed or in the closet.

These skills by which the child cares for himself depend, of course, on the character of his clothing, the nature of the house in which he lives and the attitude of surrounding adults as well as his intelligence and his general physical development. He cannot unbutton tiny buttons with small or concealed buttonholes. He cannot hang up his own coat or suit unless there are proper loop tapes by which to hang them, and hooks in the closet low enough for him to reach. He cannot care for himself in the bathroom unless he has a box or stool light enough for him to move about, steady enough so that he will not tip over when he stands on it and high enough so that he can reach the toilet or the faucets of the basin.

He will not learn respect for other people's towels and wash cloths until he has his own and a place within reach to hang them. It is true, too, that independence and the skills necessary to it are learned only gradually, and that they are only begun at the age of three. Care must be taken not to force these learnings. If adequate practice is allowed these skills are usually fairly well developed at five years, the age at which children can with supervision in matters of personal hygiene be almost entirely independent of adults. Independence can be learned only when the adults who care for the child are willing to relinquish their position of complete control over the child. There is a great temptation to do everything for the child in order to keep him entirely dependent on us as adults and consequently helpless without us. It is a subtle way of fastening him to us. Few parents would do this, even for the emotional gratification it affords them, if they realized how seriously they handicap the motor, mental and emotional growth of the child by refusing him his independence as he is capable of assuming it step by step.

Playthings and Materials to Encourage Motor Development.— Equipment and playthings which will encourage motor practice and hence the development of motor skills will offer the opportunity for activity when the child develops his readiness for the various steps of growth. We cannot and should not attempt to provide self-consciously chosen equipment which anticipates every step of growth. If we did so we should create an atmosphere of expectancy and resultant tension which would be unwholesome. No amount of equipment can encourage growth for which inner readiness is not yet mature. Too much equipment also tends to rob children of initiative, especially at the age when imagination is developing and when self-resourcefulness can be stifled by an overelaborate set of playthings. Even if we could produce the most mature phase of growth possible for each child for his every stage of readiness at each chronological age, we should not try to do so, since this in itself takes on the aspect of forcing. We should not coax him into experiences, in other words; we should let him dictate a comfortable pace for himself by letting him seek each experience when he wants to. Simple toys, a space to use them in and to keep things in and freedom to use them according to the child's own ideas are all desirable factors to be observed in the choice and use of toys and equipment.

In the use of a small set of blocks, for example, the child at one

stage of development simply dumps them out of the box, or picks them up one or two at a time and bangs them back into the box to hear the noise they make. Considerably later in development he is ready to pile one on top of another, at first being able to achieve a tower of not more than two; and about this stage he enjoys putting two or three back into the box with his mother's help as a beginning in learning how "to put them away." Later still he can pile several into a tower before it falls over, and he may begin simple bridge structures such as two blocks set a little distance apart with one on top to bridge the gap. Not until most children are well over

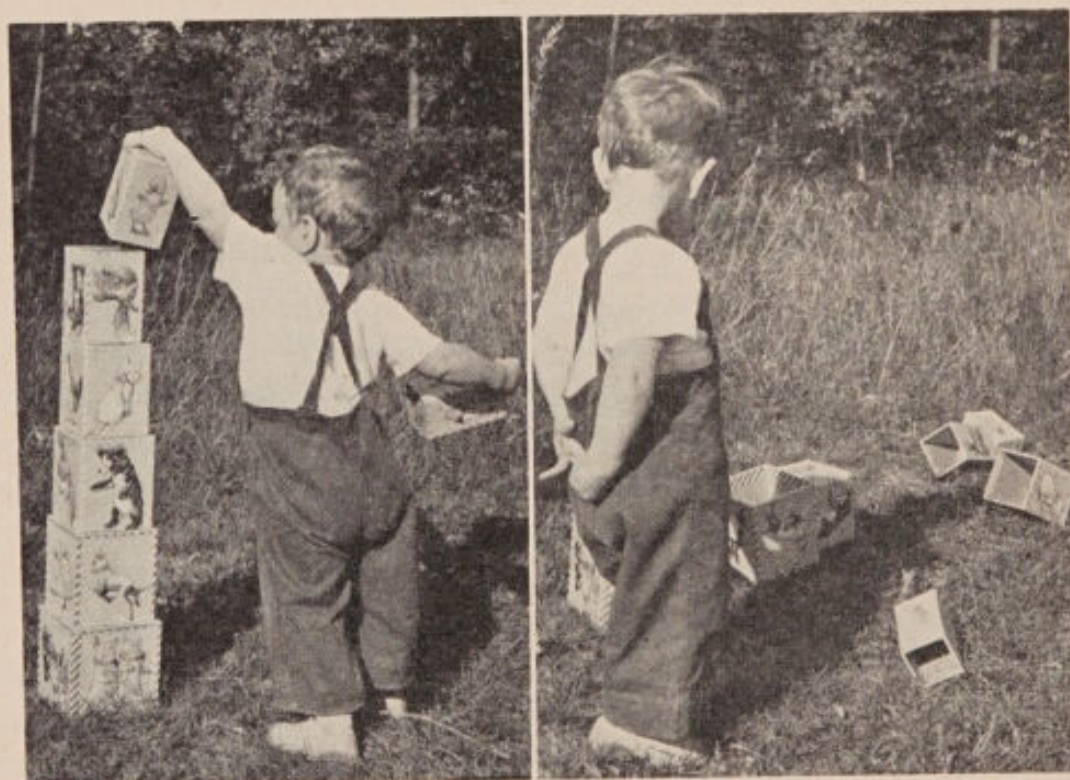


Fig. 49.—At eighteen months this child has body balance and hand control enough to build this tower. It is even more fun, however, to knock it down.

three years of chronological age do they really build with blocks as adults conceive of that activity.

In general toys and equipment fall into two classes: those which encourage vigorous, total body play, and those which encourage fine motor skills which train eye and hand to work together and which develop intelligence in other ways.

For the young infant three to four months old, a soft, fluffy ball or a rattle hung by a cord over the cradle will give much practice in reaching and grasping, in directing his hand to strike an object and in coordinating the eye muscles to follow a moving object.

The plaything should not be left there all the time, however, especially if the child is subject to overstimulation or overfatigue, nor should it be left close enough to his eyes that the lessons in convergence will teach a habit of fixating at too close a range and hence tend to turn the eyes inward. From three to seven months control of grasping and holding develops sufficiently to make a string of large wooden beads or spools a desirable plaything. Inflated rubber animals (not too large ones) are light in weight, easy to hold and easy to wash. A piece of crumpled tissue paper makes an intriguing noise when pounded or squeezed, and along with a rattle to jingle when waved, adds other opportunities to teach through the ears, as well as through the eyes, the connection between movements of the hand and results obtained. Improvised and casual playthings such as discarded containers, clothespins, ash trays, clean short pieces of rope or firm cloth are often more interesting and useful to the child than more elaborate commercial toys. Care should be taken, of course, to see that there are no loose pieces or rough, sharp edges which could injure the child's eyes, ears or nose, or which could be swallowed.

By nine or ten months a two to six-inch rubber ball can provide much reason for wriggling and chasing and can teach much eye-hand coordination. In fact, a ball of some sort is one of the most educational of toys throughout the entire period of childhood. At nine to twelve months a "tot seat" for use at home or in the family car helps keep the baby comfortable in many otherwise inconvenient spots. Nested blocks like those shown in Figure 49 will interest some children of this age, although nothing in the way of building will be done with them until several months later. A spoon and unbreakable cup may also lay the foundation for later food-getting hand-mouth skills. A play pen at this age permits many hours of safe play where the mother can be near, yet free to go about her work without fear of stepping on the child. Children now begin to enjoy simple water toys to play with in the bath.

At twelve to eighteen months a box of twelve to twenty blocks of one-inch-cube size offers practice in handling smaller objects. Larger three to four-inch blocks are also favorites at this age. Simple boxes to open and shut, cloth books with heavy bindings showing familiar objects in bright colors; a sand box with spoons or small shovel and a sieve and pail all offer opportunities for practice in hand coordination at this age. A "Kiddie Kar" offers much

practice in general bodily coordination. A "Taylor Tot" for the mother to push the child about on their walks also serves as a "Kiddie Kar." A small cart or push-and-pull toy will also encourage general bodily coordination.

Around two years of age a ten to twelve-inch board several feet long can be set up, at first on a low block, later on increasingly higher blocks for practice in balance and surety about his own body. Climbing up and down steps and slides, over packing boxes or on the jungle gym or some substitute all offer practice in the use and development of the larger muscles of the legs, arms and back and develop a surprising agility at an early age. Small cars and trucks, interlocking trains and twelve to fifteen-inch light, hollow blocks all encourage activity. Dolls begin to be popular with both boys and girls at this age, although most parents prefer to give boys cuddly pandas, dogs or other animal toys. Peg boards with large pegs, simple two or three-piece jigsaw puzzles and other toys of this kind offer opportunity for practice in hand skill as well as sense perception.

The child should, whenever possible, have a small corner of some room in the house for his own in which he may be surrounded by certain of his individual possessions and equipment. A small table and chair may be useful now. Housekeeping toys begin to offer fertile territory for the development of imaginative play, although real household equipment is often preferred. Everyone is acquainted with the baby who when first creeping finds his way to the kitchen cupboard where he loves to pull out the pots and pans and manipulate covers, parts of double boilers and the like. There are few experiences available to a young child which are more educational than play with his mother's pots and pans, since even though such play means extra dishwashing for her, she may be well rewarded by the knowledge that she is providing a profitable as well as a happy time for her baby.

At three years most children are ready for a tricycle, although some children can use one to advantage earlier. Transportation toys like wagons, a train, and a dump truck are popular. A place to climb and space for running are important. The city-bound child should be taken to parks or sent to a nursery school if he lacks a fairly large yard for play. Blocks of more complex variety, including cylinders, quarter and half circles, triangles, and the like are now challenging. Blunt scissors, colored paper, crayons, clay, and a soap-bubble pipe offer good rainy-day occupations. Simple

puzzles and a continuing collection of appropriate books* are good for developing intellectual interests and activities.

At four years the climbing opportunities, like those for balancing the body and "stunting" or "I-bet-you're-afraid-to-do-this" activities, should be increased continuously from this time throughout the childhood period. A trapeze and rings can now be added, as can a turning pole placed just beyond the child's reach so that he can take hold by means of a little jump. Families of dolls or play animals, a costume box, a wide variety of nature specimens, a blackboard with chalk, tinker toys or simple construction sets are popular. All of these materials should become gradually larger, higher, more complex or more challenging as the child grows into each successive stage of greater and greater control and coordination, both of the larger and of the smaller muscles.

In general, equipment for children from two to five years of age should be simple. Plenty of space, particularly out-of-door space, with a place to run, climb and dig should be provided. The equipment might include a shovel and pail or an old pan and spoon from the kitchen, a sand pile or an open patch of dirt, a kiddie car or a tricycle to ride, some simple and durable blocks (fairly large ones at this age) or odd bits of board, empty spools, empty oatmeal cartons, a doll (a corn stalk, dressed up will do), a carriage (a box on wheels can substitute for this), a few bits of cloth for covers, clay or a bit of mother's dough from the baking, paper and pencil (wrapping paper serves), and others. The main principle to be followed is that the material should not be useless, mechanical toys, but materials which challenge him to resourceful activity and encourage either general bodily activity or skill with the hands. They can also provide for growth, such as the development of perceptions and judgments discussed in Chapter IX and can teach technics of expression. Opportunity to care for his own physical needs, the privilege of helping about the house or the yard, playing with other children plus simple "do-with" equipment should provide even as early as two years a sound background for physical, mental and social growth.

TOPICS FOR CLASS DISCUSSION

1. In your developmental chart (see "Problems for Class Discussion, item 4 [p. 159]), in the column headed "Motor Controls" summarize the average growth standards for controls to be expected at birth, at one year, at three

* Gesell¹³⁶ has an appendix suggesting books suitable for each preschool level.

years and at five years. For building in motor areas consult the references listed below.

2. Observe some child of five years or younger. If possible select a child on whom you can make successive observations for later chapters, and from whose mother you can get developmental history in each area. How does he compare with the average standards for motor development set up in your chart? If possible, get from his mother his motor developmental history. Compare his gross motor developmental pattern with his pattern for fine motor controls. Is he a fast grower or a slow grower in either one or in both of these areas? Is he maintaining a constant channel of development (see Ch. I) or has he shifted his speed toward acceleration or deceleration of rate? Do not neglect physical factors in considering any changes.

3. Observe this child's play space and play experiences. What experiences is he having which are conducive to satisfactory motor growth? What, if any, suggestions can you make for improvement in his motor experiences?

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Intellectual Growth

(CONTINUED)

DEVELOPMENT OF ABILITY TO USE SENSE ORGANS

It is generally agreed that newborn infants are not very sensitive to the things which happen in the world around them. They do not hear, see, taste or smell as adults do. Although the actual structure of sense organs such as eyes, ears, mouth, nose and touch organs is fairly well developed at birth, the child comes to use them with efficiency and meaning only as he matures. At first his responses to stimulation of his sense organs is one of simple awareness. Only with increasing experience does he come to understand what he sees, hears, tastes, smells or touches. This process of learning the meaning of his varied sensations is called the process of developing sense perceptions and judgments. It is the process by which the child learns that his mother's face above his crib means comfort to him, that a cup is to drink from, a piece of cracker is to eat whereas a rattle is not to be eaten. This association of meaning with the things seen, heard, tasted, smelled or touched requires the use of the higher brain centers. The cortical or higher centers are immature and nonfunctional at birth,²³⁴ although their maturing occurs rapidly within the first few weeks of life. The result is that the infant begins to see, hear, taste, smell and feel quite early in the first year of life.

The Senses of Touch and Pain.—The senses of touch and pain are probably the most nearly perfect of any of the senses at birth. It is generally agreed among authors that newborn infants are not very sensitive to externally applied touch or pain stimuli. Even severe scratches or blisters do not seem to cause most babies much discomfort, although there is a definite reaction to needle pricks in most infants. This should be a comfort to the young mother who may worry unduly when her awkwardness has produced a scratch. Even though infants seem thus fairly insensitive to surface abrasions of the skin, they are quite sensitive to varying

temperatures in their bath water or in the room in which they are (see p. 144). All writers agree that care should be taken to test bath water before plunging the child into it and that the room temperature should not vary markedly or the child will become uncomfortable. Infants are probably more sensitive to colder than to warmer temperatures²⁸⁰ although authors do not agree on this point.

The sense of touch is used consciously to produce sensation by the time the infant is a month old. The tongue and lips seem to be used first for this purpose. Before the third month fingers are used consciously to produce touch sensations. Babies can often be seen at this age lying in the crib carefully touching one hand against the other for the sheer sensation produced. Throughout the preschool years touch remains one of the most pleasurable of the child's sensations. He uses it for purposes of exploration of almost everything within his reach. Combined with the ability to run around the house, this often produces a behavior problem, unless some provision is made for the child to use these capacities constructively.

The sense of touch is particularly productive of education to the mind at eighteen to thirty-six months of age, when exploration of the sensations of hardness and softness, roughness and smoothness, warmth and cold is at a peak. Children of this age are usually alert for opportunities to touch fur, a rubber raincoat, figured goods, starched cloth, silks, the woven pattern of a wicker chair and anything else that offers information about the way things feel. This running of the fingers over every available surface is really more than the mere seeking of sensations. It is also an exploration of objects as such, an endeavor to learn just what "feel" is to be associated with what "look" and what "use." The child's reaction to printed silk or to the pattern on linoleum is an example of this. He has learned in the past to associate change of level with change of line; for example, he knows that the edge of a box means a drop to the floor line. Now he is interested to discover that in some instances change of line means no change of level; so he runs his fingers over and over the pattern printed on dress or drapery materials and sometimes expresses his discovery by saying, "This looks rough—it's smooth—why?"

Learning to Use the Sense of Smell.—Earlier writers believed that the sense of smell was well developed at birth. The consensus of more recent work is that it is not well developed then, but that

it develops progressively from early infancy to the seventh or eighth month.* At this time infants, if previously taught to do it, often consciously inhale the breath in order to get a clearer smell of an object.

For some months, however, the smells that are agreeable to infants do not always coincide with judgments of adults in the matter. For example, Dearborn^{95a} reports that at eleven and one-half months his baby showed no dislike for the bad odor of rancid fish oil belonging to some small fish vertebrae she was playing with, but smelled of them deliberately to repeat the experience. He also says, however, that at one year the odor of a fresh marigold was distasteful and caused the child to turn her head away. As late as the seventeenth month Preyer²⁸³ reports his baby as unable to separate the sense of smell from that of taste, since the infant opened his mouth upon presentation of a fragrant flower. This mistake was not made by this baby after eighteen months of age. Studies of the development of the sense of smell are only now being done on groups of babies† so that we do not yet have much information about the stages of development in this area.

Learning to Use the Sense of Taste.—As in the study of smell, only now are studies of the development of the sense of taste being done on groups of babies. Individual observations, however, lead us to believe that the sense of taste is fairly discriminating at the end of a few months. (Recall that the taste buds are structurally mature soon after birth.) Preyer²⁸³ reports an accurate discrimination between salt and sweet, which are two taste impressions of like sort. Dearborn's child refused the sourness of a fairly sour orange on her two hundredth day. Shinn^{323a} reports that the taste of new foods became a source of pleasure to her niece during the first fortnight of the eighth month. Preyer reports that a new taste gave great surprise at the ninth month. The baby's judgment of pleasure in taste, like his judgment of smell, does not always correlate with adult judgment. Dearborn says that his baby seemed to enjoy a bitter taste on his two hundred and seventy-ninth day (about nine months) and did not object to castor oil until the three hundred and eighty-fifth day (about thirteen months). She showed

* Irwin.¹⁷⁹ This opinion is also based upon the fact that smell receptor structures are not as well developed as those of taste at birth.

† The work of Irwin et al., at the University of Iowa Child Welfare Research station, should soon give us more information about the sense of smell.

no objection to the bitterness of nux vomica on the five hundred and seventy-seventh day (about nineteen months). This is important to remember in relation to the feeding of children, since children frequently accept without objection foods which have high nutritional value but which many adults consider distasteful, such as kidneys, turnip, liver, and the like. Discrimination in taste can be developed early and should be trained to include a large variety of experiences through the introduction of new foods into the diet as soon as the physician prescribes them.

Learning to Use the Sense of Hearing.—Authorities differ in their reports about reactions to sound, both about the type of sound rousing reaction and about the age at which reactions occur. Nearly every writer, however, agrees that sharp or quick sounds cause blinking, starting and sometimes crying during the first few days of life. Some children listen to voice sounds before the tenth day.^{57, 205} (Recall the fact of early maturing of the tympanic membrane and other structures in the ear, p. 150.) Several writers mention instances of reaction to piano, bells, and the human voice between the second and fourth months. Association between a sound and what it means seems to be present by the second or third month if the sound heard has become familiar; for example, the step of an approaching person seems to have become associated with personal attention and is sufficient to cause the baby to stop crying.

Gesell,¹³³ who studied large numbers of children, says that an adaptive motor response to a voice or ringing of a bell (which is out of visual range) is established in practically all infants at four months. Definite and prompt turning of the head to the sound of a bell was observed at six months in 75 per cent of the infants studied. Cooing or laughing on hearing music begins to develop for the average child at six months and is present in 75 per cent of children at twelve months. Several writers report turning of the head to the sound of the voice from two to four weeks before turning to the sound of a bell. Bayley^{30a} gives credit in her scale for turning the head at the sound of a bell at five months. Bühler⁵⁹ gives credit at two months if the child turns his head when a rattle is shaken a foot and a half away and out of sight. When the sound is made, eyes remain ahead at this age, but at three months credit is given if "the eyes are directed searchingly to all sides."

Learning to Use the Sense of Sight.—The sense of sight is so imperfect at birth that reactions to sudden and pronounced

changes of light seem to be the only sight reaction observed by any of the writers on the subject. Clear sensations of sight are dependent not only upon adequate development of the nerve endings and nerve centers for vision (p. 149), but also upon two sets of muscular adjustments. One set is necessary to turn the two eyeballs (convergence) and the other set controls the lens within the eyeballs (accommodation). These two sets of muscular adjustments must be learned accurately before the eyes are effective as sense organs. This has been discussed briefly in connection with motor achievements. Sight perception, or learning to associate meaning with things seen, is dependent upon the development of motor skills prerequisite to accurate use of the eyes.

These skills of accommodation and convergence have been fairly well mastered in most infants by three months of age. Ling²²⁴ studied the development of sustained visual (eye) fixation in infants varying in age from seven minutes to twenty-four weeks, and found that the ability to fixate the eyes for brief, unsustained periods occurred after a few hours of life. This is, however, the involuntary, almost phototropic reaction of the eye to light and cannot be said to be fixation in the voluntary or controlled sense. This early, immature stage of fixation, Ling found, reached its peak at around four or five weeks of age.

Voluntary fixation is a later stage of development. The Morgans²⁵³ have given us one of the most careful studies of this type of fixation. They found the primitive, immature type of fixation in 75 per cent of babies at five to ten days of age, and in 100 per cent of babies at fifty days. The next stage of fixation described by them is that of following an object which moves horizontally from side to side. In their study most infants could do this at fifty days, and could follow a vertically moving object at fifty-five days. Following an object in a circle was accomplished by most babies only at seventy-five days or about two and one-half months. This is shown in Figure 1 in Chapter I. The perfection of the use of the eyes in sight moves forward rapidly from this time and becomes almost as perfect as the adult level of seeing at about two years of age.³²⁴ In spite of this very good ability to control the eyes at three months, the learning remains unstable for some time. It is not at all unusual to see children of several months of age momentarily lose control of the eyes so that they appear for an instant to be cross-eyed. Persistent crossing of the eyes should, however, be reported to the doctor.

Shirley³²⁴ has analyzed the overall development of vision into four maturity stages. At first there are vague reactions to a moving light or bright object which lead to focusing on persons and objects. For three months the baby's attention is largely confined to the faces and hands of those about him, to such toys as are dangled before him or put into his crib and to his own fingers. The second stage begins when the baby commences to sit up, at which time his visual range widens to include the whole room. The third stage includes fixation of attention on the remote and the minute. In the fourth stage the baby can see the shadowy, the obscure, the transparent and pictured images.

Bühler⁵⁹ places at five months the ability to look searchingly in the direction in which the child has dropped a toy. Gesell, however, found that less than half of his babies did this at six months, but that at nine months all of them did so. Bayley places turning the head to look for a fallen spoon at seven months and definite looking for it at nine months.

One of the common situations studied with babies is presentation of a mirror. Bayley gives credit on a mirror test at seven months if the child makes approach movements or tries to manipulate his own image. She gives credit at eight months if he smiles at his own image and at ten months if he plays with his image by laughing, patting, banging, leaning toward it and so on. Gesell says that children of eighteen months will often reach behind the mirror in an attempt to grasp their own image. Mirror tests are, of course, not tests of vision alone, but involve social reactions as well. (See discussion under social growth, p. 425.) They are also dependent upon the child's previous experience with mirrors, as well as with other babies, since his own image appears to him as another baby.

DEVELOPMENT OF SENSORY JUDGMENT

Much human behavior is made up of reactions toward objects in the environment and is dependent for efficiency upon accurate judgments of the size of these objects, their shape, location with reference to the observer, their rate and direction of motion and so on. Contrary to common belief, these judgments are not innate; they are learned in every detail as we shall see when we follow the pattern of that learning.

Having learned to use his eyes and ears and other sense organs, the baby must learn also to interpret the things he sees and hears;

he must learn the meaning of tastes and touches and pressures. He does this by accumulating experience with things seen, heard, tasted, touched, and so on. Thus repeated sights and sounds and other sensory experiences become familiar to him. He learns the appearance of his bottle and how to react to it, the sound of his mother's voice and what to expect from it.

Each sensory experience comes to have meaning. A rattle of pans may come to mean dinner; a round red object (his ball) rolls away if one lets go of it; a bottle with clear water in it tastes different from one with milk in it, and so on. It is important to appreciate how much of the baby's behavior that seems instinctive to the casual observer is really the product of painstaking learnings. We must realize also how important it is to offer him opportunity to learn to see, to hear, to feel and so on, with accuracy so that he may be skillful in the use of his senses which serve as the only doorways to experience, hence as the only avenue to the development of his intelligence.

The Baby's Playtime as Well as His Physical Regimen Is Constantly Educating His Growing Intelligence.—Infants are more than cunning and amusing objects; they are rapidly developing bodies, minds and personalities, learning a quantity and quality of essential life lessons that will never be equalled at any later period in life. Once the child has learned to use his eyes, his ears, his tongue, his nose and his fingers, he is placed in possession of the means of exploring everything that comes within his immediate environment. If we watch an infant several weeks old, we shall see him occasionally stop all his other activity to listen intently for some sound that has caught his attention. At three months we see him lying in his cradle exploring the surrounding scene with his eyes, listening with absorption to chance sounds and turning his head to "see" as well as to hear the sound. At four months he is seeing many things, is listening and is grasping and touching objects that come within reach. He looks, touches and listens, associating all the results of stimulation to his senses. It is these learnings in sense perceptions and judgments, along with the achievement of control over his own body, mastery of language, expression and control of emotion and reactions to people, which occupy the waking time of children from the time they are born.

Much Learning Takes Place by Associating One Sensory Experience with Another.—Shinn reports that during the second week of the fourth month her niece seemed to realize a familiar touch

when she felt her rattle but had no idea that what she saw was the same thing she felt. During the fourth week in the fourth month, however, this same baby saw her mother's hand, kept her eyes on it until her own hand struck it, then took hold of it, thus associating visual and touch perceptions. By the age of six months the baby has learned to use smell and taste as well as sight, sound and touch when he explores objects. He has learned also that lips and tongue provide not only taste sensations but touch sensations as well.

He seizes a rattle, waves it about, following it with his eyes, and turning to listen; he smells it; he puts it in his mouth tasting and touching it; he explores it with every sense at his command. And from this he learns about rattles, how big they are, what shape they are, how hard they are, how heavy, how near and what kind of noise they make. More than that, he is associating all of these things together, so that eventually the sound of the rattle reminds him of the proper size, shape, weight and use of that object. "Visual, tactual, and auditory experiences are not originally inter-related in any definite and precise manner. They become related to each other in an orderly fashion only as the subject (in our case the baby)* perfects an adequate system of localizing responses for the various stimuli that affect each sense."† In this way, a person learns to identify the various experiences obtained through one sense with their proper equivalents in other sense realms. Each object thus acquires for the baby a variety of meanings in terms of which he learns to recognize what to expect from it and what he can do with it.

Important beginnings in sense perceptions and judgments are achieved in infancy. The development of associations and meanings proceeds rapidly as the child leaves infancy, especially as he acquires the ability to walk and run and climb and thus widen his horizon. His fullness and speed in the development of sense perceptions and judgments and the skill and efficiency with which he comes to understand, use and control his environment will depend not only upon inner maturation, but also upon the richness of his environment and upon the freedom he is allowed to explore it. He cannot learn what he has not experienced. The stage of learning in which any experience is new will prove fatiguing because it requires close concentration of attention. Only when the learning

* Parentheses ours.

† Carr⁶⁹ (p. 142).

is complete and has come to function with free unconscious perfection does it cease to place demands upon the child's energy. In our eagerness to provide a rich learning environment for the child we should not clutter the environment or force learning and hence overfatigue the child.

Learning Names for Sensations and Perceptions.—We see here, too, a growth in language through which the child is achieving names for the various qualities of objects now being experienced by the senses. As we shall see later in the discussion of language growth, the period from eighteen to thirty-six months is one of rapid increase in vocabulary. This association of name with sense quality is only part of the general interest in associating the proper name with every object and experience. We must not, however, conclude that the ability to sense the quality (hardness, roughness, heaviness and the like) is dependent upon ability to apply the right language name. Children usually learn to detect and differentiate such qualities accurately before they can name them, and, conversely, they often learn the names "big," "hard," "red" and "heavy" before they can apply them accurately to the proper sense experience.

Acquaintance with His Own Body.—Perception of the extent and contour of his own body has occupied the child for some months before he is a year old and seems to be fairly clear to him by the time he is three years old. He lies in his cradle when he is four or five months old, touching the fingers of one hand against those of the other, enjoying the sensation he gets. By seven or eight months he has learned to get his toes into his mouth, but he still has to learn that when he bites those toes, he gives himself a sensation because the feet belong to him. Sometimes he bites a finger or a toe, then bites a rattle, studying the difference and learning that toes and fingers are part of himself whereas rattles are not. Before he is a year old he has begun conscious exploration of his own body, studying its extent and exploring its contour. He pats his own head, fingers his own ears and rubs his own stomach. Not infrequently he discovers that some parts of his body give one type of sensation, some parts another. He may discover at a year or at eighteen months, sometimes at two or even at three years, that patting or rubbing the genital organs produces a particularly pleasing sensation, and he will return to the exploration of this part of his body even more often than to his play with ears or toes.

Our attitude toward this activity will determine in a large measure how often he returns and to what extent his passing interest will become fixed as a habit. If we become anxious, conveying to him that he has discovered a particularly significant type of behavior, he will reflect our own attitude of importance toward it, will return to it more often and give it more attention than he otherwise would. If, on the other hand, we regard the behavior as part of the general exploratory behavior characteristic of the ages from one-half year to five years, he will more than likely so regard it and will soon forget it as his interest shifts to the next natural activity. We may, of course, treat the behavior like any other piece of undesirable behavior such as pulling at his ears too constantly or playing with the ink bottle too persistently and we may distract his attention by giving the hands more entertaining things to do, and we may clothe him or tuck him into bed in such a way that the genital organs are not easily accessible to him. Anything we do, however, to fix his attention on the behavior or to attach vivid significance to it serves only to deepen the impression and to defeat the end we have in view, namely, to allow him to forget it and to lead his interest into more acceptable activity.

Learning to Understand Sounds.—The development of perceptions of sound is rapid from eighteen months to three years of age. The child during this period learns to identify countless sounds that have not heretofore held meaning for him. He learns to identify by sound the difference between bird calls and squirrel noises, between Daddy's voice and Mr. Smith's voice, the special tone which identifies Daddy's automobile horn and so on. Doubtless his growth in the language field seems more spectacular than it really is because his vocabulary increases rapidly at this time, so that he may appear to be learning for the first time meanings which he has learned before but can only now express. In any case, he seems to be acquiring understanding of the sound world about him at a spectacular rate.

His interest in and ability with music also increases rapidly at this age. Although there are tremendous differences among individual children in capacity to enjoy and to respond to music, most children of three years have learned to recognize a few simple tunes, can beat a fairly good simple rhythm, can detect the difference between high notes and low ones, between slow and rapid rhythms and between loud and soft intensities in music. Some children can also sing simple melodies. In this, as in all other as-

pects of learning, skill depends not only upon original endowment but upon opportunity to learn as well. In some homes where children hear a great deal of music, sharing it with people who appreciate it, they learn a genuine appreciation at an early age. There is the danger, as elsewhere in learning, that an appearance of appreciation and interest may be simulated because it is constantly expected. Artificiality is no more desirable here than anywhere else in character growth.

Learning to Judge Sizes of Objects.—Perception of size is becoming much more accurate from eighteen months to three years of age, but is still inaccurate enough to prove difficult to the child. For children from one to five years old Madame Montessori as early as 1916 appreciated the need of training sense perceptions and designed many types of equipment especially adapted for this purpose. Among them are several for training perception of size: sets of cylinders varying in diameter but not in depth, or in depth but not in diameter, and one set which varies in both dimensions; a set of blocks which, if arranged in graded size, builds a broad stair; and another set which, if piled in order of size, builds a pyramid. Nests of hollow cubes, varying in size so that they may be fitted inside of one another, make an excellent toy for training the perception of size and are of great interest to two-year-old children. Modifications of these toys can now be found in the educational toy departments in most department stores. They are standard equipment in most nursery schools. Much can be done in formal teaching with such equipment, but children were learning judgments of size, of shape, of weight and the like centuries before it occurred to anyone to teach them formally. We must be careful to avoid the error of concluding that these fundamental learnings would not take place without formal teaching. Our object should be to give the child opportunities to handle many objects in order to increase his familiarity with the properties of size, shape, weight, texture and so on.

We also see this process of self-teaching in the play yard. While riding his kiddie car or tricycle, the two-year-old child must learn to judge the width and length of his vehicle in proportion to the width of an opening through which he wishes to take it. If given sufficient practice he can, before he is three years old, become expert enough to avoid scratching vehicle or furniture. At eight months one of Koffka's²⁰⁵ subjects, while awaiting his bottle, was shown a doll's bottle about one fifteenth the usual bottle size. The

baby reached for it as eagerly as if it were his own bottle. The child makes few such mistakes with objects after he is three years old, yet some months after he has learned fairly accurate judgments of the size of most objects he can still be seen trying to sit on a tiny doll's chair and looking surprised when it fails to support him. Since he sees himself least and has less opportunity to judge his own size in relation to other things, he can still be seen making mistakes in judgment of his own size even when he is well past his fourth birthday. One very intelligent child of five looked surprised when he failed to step over a three-foot chicken wire fence with the same easy gesture that had carried his father over it.

Perceptions of Shape.—Judgments of shape are progressing rapidly during the ages from two to five. An eighteen-months-old child can discriminate between pictures of familiar animals, and he will say "bow-wow" when he sees the picture of a dog or will crow upon seeing the picture of a rooster. He interests us, however, by the fact that his perception of detail is of so little importance that he recognizes these pictures almost as readily upside down as rightside up. The two-year-old child is just beginning to have an appreciation of the difference between a triangular, a circular and a square block if all are about the same size. If allowed to play with the pans in the kitchen cabinet, he may try to make a triangular cover fit a round pan, or a square pan fit inside a round one. He could not, as has been said earlier, have a better set of equipment for teaching size, shape, weight and motor coordination than the pans from the kitchen cupboard. Nor could he be provided with expensive toys that would teach these fundamental lessons better than the empty coffee cans, oatmeal cartons, discarded spools and other equipment offered by even the simplest home.

In this connection we must remember once more not to confuse the child's ability to name "square," "round" or "oblong" with his ability actually to see and appreciate the differences in contour which these terms represent. To perceive shape is one thing; to name it is quite a different thing. We are concerned now with the perceiving, with providing numerous "shape" experiences so that the child may learn to recognize everyday objects by their shapes as well as their sizes, colors, weights and so on.

Learning about Colors.—Color perception occupies an important place in the child's interest at an early age. Staples,³⁴³ in a careful study of color recognition, was sure that colors are experienced

as different from greys by fifteen months. Most authors agree that colors as well as brightness are recognized at about thirty months of age. This does not mean that children name colors at this age without a great deal of coaching; it means, rather, that they have learned to discriminate between colors so that they can match saturated colors accurately. The naming of the primary colors (red, yellow, blue and green) is just beginning at two years. Most children can name them accurately at around four years of age.

There have been several studies of the color preferences of infants and of school-age children. Staples found red the most effective color stimulus with preschool children, yellow being next, then blue and last, green. Munroe^{255a} studied 1612 paintings obtained from 138 children ranging in age from two years to four years and eleven months. She found that the two-year-old children showed a marked preference for yellow. The three and four-year-old children preferred red, the four-year-old group preferring it less markedly than the three-year-old group. These studies make it appear that infants prefer red or yellow, and that the preference shifts with increasing age to blue.

Color naming, as we have said, seems a different matter from color discrimination and color preference. Munroe found that preschool children name blue with the highest percentage of accuracy, red is a close second and green and yellow follow in order. The most frequently used color name, regardless of correct application, was blue. Johnson^{192a} found red named most accurately at two years, blue being next and then yellow; green was failed by all of her two-year-old subjects.

There seems enough difference of opinion here that we need feel no necessity for choosing toys of any special color. A greater concern should be that the color is attractive, nonpoisonous and durable.

Learning to Judge Weights.—Accurate perception of weight depends upon judgment of size and knowledge of the weight of various materials, as well as upon maturity of nerve centers. Big objects ordinarily weigh more than small ones, although a large bag of feathers often weighs less than a very small bit of lead. Young children often find confusion because weight varies with the material of which the object is composed as well as with the size of the object. At Hallowe'en time one group of three and four-year-old children, having played for a day with a papier-mâché pumpkin which closely resembled a real one, were presented with

a real pumpkin. One of the children reached out his hands to accept the gift, but made a muscular adjustment sufficient to hold only the paper pumpkin with which he had played the day before. This was, of course, insufficient to sustain the weight of the real pumpkin, which he dropped. All of the children seemed as surprised as he when they came to lift the real pumpkin, and asked many questions about the reasons for the difference in weight between that and the one they had played with the day before. Even at four years of age they had not yet learned enough about judgment of weight to avoid such an incident.

Imperfect Judgments Are Often a Source of Trouble for Young Children.—Two-year-old children are faced many times a day with situations as puzzling as this. They reach to pick up a pail with the same free gesture they have seen an adult use, and are astonished that they cannot lift it. They learn about how much muscular pull is necessary to lift a pail of sand and make the same sort of muscular adjustment to lift a rubber ball of the same size. It is not at all unusual to see a two-year-old child upset himself because he has prepared to lift a heavy object, only to find himself lifting a light one. Often he attempts to lift things he cannot move at all. One day he seems to have discovered that big things are the heavy ones and little things are light, only to find that some big thing upsets him because it is light and some little thing cannot be moved, no matter how hard he tugs at it. Many times he must conclude within his own thoughts that he lives in an arbitrary world at best.

A two-year-old child has a widely increased environment available to him through his newly acquired motor skills; he has an appetite for control over objects stimulated by his growing skill in control over his body and especially over his hands; yet he finds himself confronted with inability to judge sizes, shapes and weight—an inability which often interrupts his projects, gives him many bumps and peoples the world with objects which seem to him arbitrarily bent upon teasing him. It is little wonder that two-year-old children suffer a brief period of temper tantrums.

Accurate Judgments of Distance Depend upon Many Factors.—Some of the more complex perceptions are being built during the three to five-year-old period. The perception of distance particularly is developing at this time. Like all perceptions, it is built through experience, and accuracy in this judgment grows as other habits grow. Although it is not necessary for us to memorize the

criteria by which distance is judged, it will help our understanding of the child's problem to see what these criteria are. An object is judged to be near or far depending upon:

1. The apparent size: large if near, small if far away. This can often be judged by comparison with known familiar objects like trees, houses, and the like.
2. The clearness of outline: clear if near, hazy if far away.
3. The amount of detail visible: detail can be seen if near, cannot be seen if far away.
4. Vividness of color: colors appear saturated if near, more neutral if far away.
5. Number of intervening objects: few if the object being judged is near, many if it is far away.
6. The accommodatory and convergent strains on the eyes as they adjust to nearness or farness.

There are other criteria by which objects are judged to be near or far, but these are sufficient to give us some appreciation of the complexity of the perceptions by which distance is judged. Unless we stop to analyze such a judgment process we are likely to think that it is the function of an inborn capacity. Yet, we must realize that it is a learned function, and that skill with it is achieved only through experience and practice.

This Complex Judgment Can Be Learned Only through Experience.—We can see how much judgment of distance is a learned function dependent upon habit if we change from a low, moist climate where density of atmosphere tends to obliterate line and color, to a high, dry climate where clearness of atmosphere permits line and color to be seen over great distances. Distances are grossly underestimated in the clearer atmosphere. From such misjudgments come the many stories of eastern tourists who visit Colorado and start to walk "to Pike's Peak before breakfast" only to find themselves walking hours later but still miles from Pike's Peak. Accustomed to judging as only a few city blocks in distance the clearness of outline and vividness of coloring and detail that they see in the mountain peak, they find it hard to realize that under different atmospheric conditions their judgment can be in error by 20 or 30 miles.

Much Human Behavior That Seems Automatic Has Actually Been Learned in Early Childhood.—Judgments of distance probably show more clearly than any other type of judgment how much adult behavior which we take for granted as automatic or perhaps as innate is in reality the product of painstaking learning in early

childhood. As illustration of misjudgment of distance at three months see Figure 50. A three-months-old baby in this instance reaches for a proffered toy, but neither his muscular adjustment nor his judgment of distance is good, so he misses it. He had to make several attempts before his hand closed over the coveted object. An infant, however, soon learns accurate judgment of shorter distances, but at a year he still reaches eagerly for the moon, and seems unable to understand why it cannot be obtained. At three years his judgment of distance is still inaccurate enough to cause him to make many mistakes. He sometimes forgets that distance diminishes apparent size so that he comments on "the baby automobile," which he sees at some distance. But from three to five

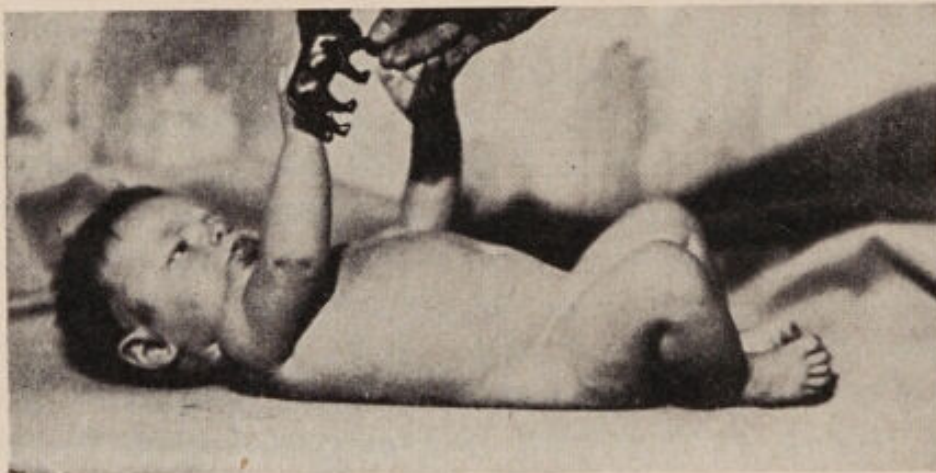


Fig. 50.—This three-months-old baby has finally directed his hands toward the object but has misjudged his distance and has therefore failed to obtain the object. Note the studied expression on his face as he concentrates at his task.

years he makes such mistakes less and less frequently as he builds his understanding of the principles involved. The speed with which he progresses depends, of course, upon his native intelligence and upon his opportunity to learn.

Learning about Numbers.—Interest in number, although evident before three years of age, does not occupy the time and attention that it does after three. Some children display this interest sooner than others, although it would be difficult to determine without a carefully checked study how much of such an interest when it does appear is spontaneous and how much is reflection of adult interest in calling the child's attention to the concept of number. Even at nine months the baby has an awareness of "two-ness" in contrast to "one-ness," since he can put two objects together in relation to

each other and prefers two clothespins to one as playthings.¹³⁶ Children of eighteen months will often lay blocks or beads out in rows of two or three. We cannot be sure whether this ability is appreciation of similarity of size and shape of groups of two or three units to other like groups, or whether it is ability to appreciate that each group is made up of one and one or of one and one and one. Children of two can often be heard counting "one and another," or "one and one" or, sometimes, "one, two." After two years interest in language is at a peak so that one can readily teach a two-year-old child to recite the cardinal numbers up to eight or ten, or, with sufficient coaching, up to nineteen or twenty. This sort of recitation, however, belongs to the condemned category of "parlor tricks" since children of two or even of three years have no understanding of the meaning of number beyond "one," "two," possibly "three," and "lots." Although they can be taught to recite numbers "parrot fashion" they cannot without excessive coaching actually count a series of more than four objects until they are nearly four years old mentally, or of thirteen objects until they are nearly six mentally.

Learning to Judge Time Intervals.—Perception of time develops very slowly and is expressed almost invariably through language so that its actual progress is difficult to measure. Judgment of time is probably the least accurate of all adult judgments although most adults fail to realize this fact. When we are busy and interested time seems to pass rapidly; when we are idle and bored time seems to drag. Failing to realize this adults are often unfair to children who not only find the same thing true, but who have had much less experience with time than older people have had. A mother takes her child to call upon one of her friends, telling him to sit quietly while she visits. She is interested and time flies; he is bored and time drags. Half an hour seems only a few minutes to her but hours to him, so that when he becomes restless or resorts to some means of entertaining himself she becomes impatient at his seeming unreasonableness. Again, she sits reading an interesting book when he asks if she will help him reach something he needs in his play. She answers, "Just a minute, dear," but continues to read. Several minutes later, after an interval that seems less than a minute to her but an endless time to him, she attends to his need. He gets very little help in judging "minutes" from such an experience.

Again, for example, the child is allowed to go out to play for "half an hour," and called to come inside after what seems almost

no time at all. Or he is told to sit quietly for "half an hour" and is released only after what seems to him almost forever. "Half an hour" is indeed a variable quantity to a young child who has not yet learned to judge it with the objective aid of a clock. By the time he is four, however, he has learned that "a few minutes" means less than "an hour" or "several hours," although he still seems unreasonable when he is told that "we won't be going to town for a long time—not for several hours," but returns every half hour or so to ask, "Isn't it time to go yet?" When he is two there seems no other way of explaining "when Daddy will be home" than to tell him that it will be "after you've had your lunch and have had your nap and have played a long time"; but at four years "afternoon" means after lunch, and "late this afternoon" means a long time after lunch, in fact, just before supper. At four he will understand when we tell him that "Daddy will be home late this afternoon." Questions like "When is noon?", "How long is half an hour?", "When is tomorrow?" are familiar on the lips of four-year-old children. "Yesterday," "tomorrow," "next week" still puzzle the four-year-old. Norsworthy and Whitley²⁶⁷ say that such complex time concepts as "last spring," "day before yesterday" and "a month ago" are quite unintelligible even to six-year-old children.

The Problem of Dallying Due Largely to Inability to Appreciate Time Intervals.—Inability to appreciate time units produces a characteristic problem at four and five years, namely, the problem of dallying. Sitting indefinitely before distasteful foods and occupying endless periods of time at dressing or picking up toys, are traits that cause a great deal of annoyance. After the newness of feeding himself or of dressing himself has worn off, the task loses the interest it once had for the child, and time drags. Add to this the clumsiness of fingers, comparatively skillful, yet in reality slow in dealing with exacting tasks, along with the inexperience which has not yet learned that uninteresting duties do not last forever, and the result is procrastination and dallying. Anything that revives interest in the task to be done will help; but the particular need of the dallying child is an appreciation that time passes, that the longer he spends in the performance of routine duties the less time he has for play. An hourglass with the sand constantly dripping or a clock with hands that relentlessly tell the passage of time often help with this problem. A race with the sand or with the hands of the clock usually provides interest, and will surely make

clear the fact that dallying only lengthens the time spent on routine and thus automatically shortens the time for uninterrupted play.

DEVELOPMENT OF LANGUAGE

What Language Is.—Language is generally understood to include any and all means of expressing feeling and thought: facial expression, gesture, as well as spoken and written words. Many writers consider that the child's language development begins at birth. Philosophers like Kant have suggested that the birth cry expresses "wrath at the catastrophe of birth." Psychologists would deny that the newborn baby has enough development of the ego to express anything. Physiologists, however, attribute to even the earliest vocalizations a function in the beginning of developing mechanical control over the vocal apparatus.

Speaking consists of a complex muscular coordination which involves voluntary muscular actions of the abdominal wall, the thorax, larynx, soft palate, and tongue and lips, and it is performed without conscious thought. Voice sounds are emitted from the mouth because a regulated expiration of breath forces air past the vocal cords, which vibrate variously in response, on through a passage which can be modified to produce the exact sound desired.²⁰⁰ From the moment of birth the waking hours of the infant are almost as ceaselessly occupied with vocal activities as they are with random activity of the arms and legs. In the sense that the skills of walking can be said to develop from apparently instinctive beginnings in locomotion displayed in random muscular activity, so the skills of talking can be said to develop from the apparently instinctive beginnings in vocalization displayed in vocal sounds.

Early Stages of Speech.—Within the first month or so mothers usually feel that they can interpret the nature of the child's crying. Sociologists¹⁹⁸ tell us that in the development of speech in man as a race emotional cries and nonrepresentational sounds may be placed among the basic classifications. Sounds can express emotional states. They are, in fact, to be thought of as part of a total bodily reaction elicited in exciting or strenuous situations. Another classification of vocal expression in man consists of variations in an individual's voice quality and intensity under different circumstances. It is to be expected, then, that early in the development of language in the individual baby the emotional tone of the cry, the quality and intensity of the voice, would indicate some-

thing of his inner needs and feelings. The actual control of muscles which push air over the voice mechanism and the control of the vocal apparatus which produces crying is present at birth. In the sense that the ability to cry at all is the mature stage of many complex coordinations, even newborns are mature.

The variations of crying which express needs and emotions, however, seem to develop only after a month or so of life. Gesell says that at about eight weeks the hunger cry which has until that time been universal in infants now tends to diminish in intensity and frequency. The child begins to substitute fussing for crying, and he is quiet for longer periods of time when he is awake because he is becoming interested in various forms of nonfeeding behavior. During the first six weeks of life the baby cries not only because of hunger but also when his diaper is wet or soiled, sometimes even crying out in his sleep for this reason. Usually after six weeks "he accepts this condition with a nonchalance which may continue to the age of 12 or 15 months, or even later."*

Work in the analysis of the exact way in which vowel and other sounds are produced in the earliest stages of speech is now under way.¹⁸⁰ General observation has led to the conclusion that the first utterances of recognizable beginning in spoken language sounds are usually some modification of the vowel sounds of *a* and *u*, which require little active participation of the tongue and mouth muscles. Then consonants appear in combination with these vowel sounds, *m* being the consonant reported as the first to appear by the majority of observers. Among the earliest sounds are also a variety of "clicks," "grunts" and "gurgles."¹⁹⁸ Most of the vowel and consonant sounds and sound combinations have been mastered by normally maturing infants by four to eight months. In this stage of random articulation or babble stage of language development the basis for all later speech is laid since the infant in this stage approximates the basic sounds of all tongues spoken by the human race.

These random sounds become organized vocal habits, depending upon whether or not they produce satisfying results for the child and upon the pattern or model of language the child hears around him. For example, if the infant is surrounded by English-speaking people, those sounds which are useful to English are selected for commendation and attention and hence preserved, while those not relevant to English are ignored and thus eliminated as

* Gesell¹³⁶ (p. 88).

unproductive of results. Thus random vocalizations become vocal habits, and vocal habits in turn become language habits.

The child is also influenced by the language pattern he hears around him, with the result that his own sound experimentation is reinforced by constant hearing of the sounds of his native language. The diction, pronunciation and early manner of gesturing with the hands and inflecting with the voice are, by the same process, influenced by the social environment of the child. By the age of nine to twelve months the random and meaningless character of the babblings seems to become softened into rhythm somewhat similar to the rhythm of flowing speech, and it closely resembles the rhythm of whatever speech the child hears. It is not unusual to hear a child of ten or twelve months cooing or jabbering to himself with a rhythm which sounds like a free-flowing conversation. Most parents have an impulse to talk to their children while bathing or tending them. This, fortunately, is a parental impulse which should be obeyed, since it provides the child not only with a model for rhythm during early infancy, but with a model for vocabulary as his development progresses.

Most children have developed a sufficiently discriminating reaction to language to permit recognition of their own names by the time they are six or eight months old, and by the time they are eight or nine months old they understand either the word "no" or the tone in which it is spoken when it is used to forbid action. Just how this attachment of meaning to definite words occurs in the brain is not as yet known.²⁰⁰ It is known, however, that this connection which attaches meaning to words is established in early childhood and endures with fair efficiency through life even though hearing, which provides the constant model for practice of these associations, may later be damaged. When once established, "The muscular habits of speech are usually retained after the cessation of hearing, although the extent to which this is true varies greatly with age. Children under five forget much of their speech if they become too deaf to hear it even after they have obtained full use of it; while up to the age of seven or eight, children in such a predicament may become so defective in their speech that it is unintelligible. The pitch changes are diminished so that the voice becomes monotonous, and the movements of the tongue may be so careless that articulation is poor."*

The process of attaching meaning to the sounds heard leads the

* Kerridge²⁰⁰ (p. 74 f.).

child to the understanding of words spoken to him. Thus he develops a *passive* or understanding *vocabulary*. The processes of selecting out of his own random vocalizations the combinations of sounds which will convey meaning to others leads him to speak the words to which other people will react. Thus he develops an *active* or usable *vocabulary*. Children (like adults) understand many more words than they use in their active speech and writing. This is particularly true of very young children who are in the process of developing the first stages of both passive and active vocabulary.

Development of the Passive Vocabulary.—As we have seen, most infants recognize their own names (or the much more frequently used word “baby”) by the time they are six or eight months old. They usually come to understand that “no” means “stop what you are doing” by eight or nine months. From this stage on, passive vocabulary develops rapidly, the speed of its development depending upon inner maturation and also, to an important degree, upon how much language the child hears. By twelve to fifteen months most children understand a fairly wide assortment of simple, concrete or action words like “ball,” “dinner,” “drink” and “bye-bye.” Within two or three months of this stage they understand and react to simple sentences like “Where is baby’s ball?” “Give mother the spoon,” “Want to go bye-bye?” In the earlier stage the response to “Give mother the spoon,” would have been an undifferentiated reaction to the single word “mother,” or perhaps “spoon.” Perhaps the baby would have looked at his mother, held out his arms to her or leaned forward expectantly with his mouth open for food. In the later stage he understands the whole sentence and picks up the spoon to hand it to his mother.

He can be given a good deal of help at this stage if we speak slowly, clearly and very simply to him, providing him with plenty of language to listen to and fitting each word or phrase to the appropriate object or action. For example, when dressing him we may speak of his “shoes,” his “dress” and his “stockings” as each is used. In feeding him we may refer to his “spoon,” his “milk” and his “orange juice,” thus associating the right sound with its appropriate object. If we say, “Throw the ball,” as he throws it or “No,” as we draw his hand away from a forbidden object, we help him to associate the right sounds with their appropriate action. Practice with “Where is baby’s nose?” “Cover up your dollie,” and “Show mother the book,” provides the child with a pleasant game

—unless, of course, it is overdone—and it gradually increases his understanding or passive vocabulary which he is soon to put into active use. Children react to tones of voice at this stage of language learning perhaps even more than they do in later years of childhood. Since the child is not yet able to clearly differentiate separate words and sentences to any great extent, he reacts to much of what is said to him largely by implication from the tone of voice used.

The child understands the simple, concrete words first as he learns to speak them first. He understands simple action phrases and sentences before he can comprehend and react to more complex sentences. Prepositions, and phrases of relationship, like “in,” “on,” “under,” “on top of” follow later. Although children of two years demonstrate that they can understand a wealth of words and phrases and sentences of action and concrete situations, they understand and react correctly to an average of only three prepositions.¹³³ By three to four years, however, most children understand the basic vocabulary of their native language, although their intellectual capacity to handle complex thoughts is still very limited (see *Reasoning*, p. 322 ff.). They should not be “snowed under” with too much talking.

Development of Active Vocabulary.—At about one year, children have already a fairly wide active vocabulary of gestures and facial expressions, but their active vocabulary of spoken words is seldom more than two or three such simple words as “ma-ma,” “da-da,” or “bye-bye.” Although passive vocabulary seems to develop quite rapidly from a year of age on, active vocabulary does not move forward as long as the child is using his energy in the achievement of upright locomotion. This illustrates the principle that when growth energy is being consumed at a high rate of speed in one activity, it cannot flow into other learning processes at as high a rate. Most children are deeply absorbed in the achievement of the stepping and independent walking stages of locomotion between twelve and eighteen or twenty months of chronological age. Their acquisition of active vocabulary is ordinarily slow at this time. One writer* has reported that the children studied by her showed a lull in vocabulary increase during the learning of each new motor skill. Another† reports a slowing of vocabulary learning during the period when toilet reliability is being established. This slowing down in the acquisition of active vocabulary is particularly true

* Shirley.³²⁴

† Hull and Hull.^{176a}

of boys who seem on the whole to throw more energy into bodily activity at all stages of preadolescent growth than girls. There are distinct sex differences in the rate of acquisition of active vocabulary, girls acquiring speech sooner than boys. According to humorists, at least, they continue throughout life to use that facility oftener and more aggressively than boys or men.

Some girls, and a few boys, have from 10 to 100 words in the active vocabulary at around eighteen months of age. The average for all children is about five words. Some children, more boys than girls, do not have as many as five words in their active vocabularies until they are two or two and one-half years of age. When upright locomotion is reasonably well under control, the active vocabulary spurts forward. Gesell expresses this rapid growth: "Indeed, before five years of age, within his limits, he (the child) becomes an entertaining raconteur, whereas four years earlier he was unable to articulate a single word."* The rate of acquisition is around 500 to 600 words per year, and beginning with the stage in which it is started, the increase continues at this rate until well into adolescence in our society in which children go to school. Unless the child goes to school or continues to have exposure to vocabularies larger than his own, however, his vocabulary increases will cease. This proves to be true in the case where the child's parents and neighborhood possess only limited vocabularies and where he gets very little schooling. Even with good or superior general intelligence he does not learn the meaning of words which he never hears or reads.

One stage of language acquisition which has been recognized by most authors, but carefully studied as yet by only one or two,¹⁹⁸ occurs when the child is first acquiring active words at a rapid rate. At this stage he is likely to modify his pronunciation of words to fit his own individual pattern of vocalization. In this stage the child, having acquired the new word, often with correct pronunciation in the first few repetitions of it, proceeds to distort the pronunciation while still using it correctly. The distortion takes a characteristic form which fits into the child's whole pattern of vocalization at the time. For example, "Words containing phonetic elements difficult for the child are modified to make for easy vocalization. Economy of effort is not the only distorting factor, however. The child for a time goes on a vocal spree in which it practices two or three phonetic elements. Words previously uttered correctly are now distorted by the substitution of the practiced syl-

* Gesell^{132a} (p. 221).

lable. For example, a child may turn all its *da* sounds into *ga* sounds.

"This phenomenon is not the same as the incomprehensible speech of the child due to inability to master all the difficult consonants. It refers to articulate sounds which the child is able to make as evidenced by its first correct pronunciation of them. It results from the influence of his manner of vocalizing during a given period. Similar phenomena are found in other forms of learning. The first few times we practice an act of skill we may do it correctly. Later we modify it to suit our personalities. For example, a person may start playing tennis by using the correct grip taught by an instructor. After a time, however, he finds himself slipping to a grip more in keeping with his habitual pattern of grasping objects."*

This so-called "baby talk" lasts for a longer or shorter time, depending upon the child. The distortions often sound "cute" and tempt adults to talk to the child using the same distortions. This is not a wise thing for the adults to do, however, since it robs the child of the correct model for learning and unnecessarily delays his emergence from this stage of language learning. The natural situation is such, however, that, even though fond adults may try to understand and even to imitate these distortions, other children seldom react favorably to them. Furthermore, even the fondest adult sometimes cannot understand them. Hence they fail, at least in some situations, to get results for the child who uses them. The child, therefore, in order to get what he wants or to be understood in his effort to communicate an idea, tends to veer toward the correct form until he has finally overcome the distortion. In cases where distortions persist for any length of time in spite of good models, the child should be taken to a physician or, preferably, if one is available, a speech specialist, since a defect in structure of the speech mechanism may be to blame for the prolongation of this stage.

In the usual course of events children around this stage of language learning discover that everything has a name. When this happens, they plague adults with the eternal query, "What's that?" Some children discover this to be a means of getting attention and rather "overwork" the situation, but reasonable answers to these queries usually serve to extend active vocabulary at a rapid rate. Often, given the answer, the child repeats the word himself, thus

* Katz and Schanck¹⁹⁸ (p. 370 f.).

giving himself practice with it. So persistent is the tendency to repeat after the adult at about this stage of language development that a name has been given to the period. It has been called the period of "echolalia," because the child seems for a time to be almost an echo of the adult.

This echoing of the adult sometimes contributes to the child's natural confusion about pronouns at this stage. He hears himself referred to as "baby," or as "John." He echoes by referring to himself, "Baby wants a drink," or "John wants to go bye-bye." He soon corrects this, however, so that we should spare him the strain of nagging him constantly with the corrected form: "No, you mean, *I* want a drink." Confusion between such pronouns as "me" and "I," "him," "her," "his" and "hers" is natural at this stage of language development. Among the first words to be acquired, verbs, adjectives and adverbs appear correctly, but articles, conjunctions, the more advanced forms of adverbs and the correct use of pronouns and prepositions appear late in the development of speech forms. Many children of three to five years still fail to use many prepositions accurately.

When any new form is acquired, however, it is usually practiced vigorously, as is any new learning in any area. Since language is very much in the making during the preschool years when increasingly new forms of language learning take place there is much practice by most children. The impression most people have of preschool children as being constantly jabbering and constantly on the move physically is an accurate one. They do talk constantly using as many as 11,000 to 12,000 words in a day at three years of age and around 15,000 in a day at four years. In the studies in which these figures were established* the three-year-olds used 37 per cent of their total vocabulary in one day, and the four-year-olds used 23 per cent. Few older children or adults use any such proportion of their total potential vocabularies, even in a period of weeks or months.

Building of Sentences.—Building of phrases follows soon after the echolalia stage and often overlaps with it. Such phrases as "pretty flower," "no, don't want to," "all gone" and "it broke" characterize this stage, the first real sentences being characteristically made up of noun-verb combinations. At this stage children are usually willing to add "please" to the frequent "give me" or "help Bobby." More complex sentences soon follow although

* Brandenberg⁵⁰ and Nice.²⁶⁵

complex compound sentences do not appear in most children's speech before four or five years. Almost every complete form of sentence structure appears by six years of age among children who will ever use such complex sentences. Some people, of course, never learn to speak with any but a limited vocabulary and fairly simple sentence forms. Sex differences appear here as in all early language stages. Some girls talk in phrases or even simple sentences at eighteen to twenty-four months; only very exceptional boys do this. Most girls are able to express themselves in simple or even complex sentences before they are thirty months old, whereas a far smaller percentage of boys are able to do this. Boys, on the whole, lag from three to six months behind girls at this stage of language development. (See discussion of McCarthy's and Decroly's studies on p. 313.)

When we consider that command of such a variety of sentence forms means that the child's command of the mechanics of language is nearly complete, we can appreciate something of the amount of language learning that has taken place during the preschool years. Written language follows the preschool stage if children are given formal schooling.

The Question-Asking Stage.—At about the time the child can put together enough words to form a question beyond the simple "What's that?" mentioned earlier, they feed their growing intelligences by asking innumerable questions. The question-asking stage is sometimes regarded by parents as amusing, sometimes as annoying. Occasionally it is regarded as it should be, namely, as a serious effort to extend vocabulary and to gain information. Its possible abuse by the child is discussed elsewhere. One writer⁵⁰ found that in a single day his three-year-old child asked 376 questions and that his four-year-old child asked 397. Most questions are attempts to gain information and to clarify the hazy territory between reality and imagination, but they are sometimes attempts to seek justification for an act or an idea.

Some Children's Questions are of Special Significance.—Among the questions which are usual to three and four-year-old children are questions about sex, death and God. "What is the difference between little boys and little girls?" "Where do babies come from?" "What does it mean to die?" "What is God like?" are almost inevitable questions during the period of widespread interest in words and in facts. The child has much difficulty with "Mr." and "Mrs.," with "yes, ma'm" and "yes, sir," with "him" and

“her,” and with “he” and “she.” It is to be expected that in the course of his inquiries about everything that interests or puzzles him he will ask what essential difference divides the world so obviously, hence the question, “What is the difference between boys and girls?” Or, again, a new baby may arrive, or some one may die in the child’s own home or in the neighborhood. We must not regard the child as morbid, but rather as intelligent if he asks “where” or “what” in such an instance. We answer many of his other questions with “God made it,” or “God takes care of that”; we must not think him irreligious if he asks “Who [or What] is God?” These questions, like all his other questions, should be answered truthfully, simply and without sentimentality or tense emotional accompaniment. Sometimes, of course, in order to answer truthfully we must answer that we do not know, but this answer must never be allowed to substitute for information which we do have and which we should give the child in simple form as soon as he is interested enough to ask for it.

Studies of the Content of Children’s Speech.—The content of a child’s speech is significant not only as a measure of his language growth but as a measure of character and personality growth as well. Piaget²⁷⁷ studied the language of two children in Geneva and has published one of the most comprehensive analyses of the language content of young children. He found two distinct classifications of language as it functions in relation to thought, namely, egocentric speech and socialized speech. Egocentric speech is speech which has no social function, such as the monologues which accompany action or which verbalize fantasies, and the soliloquies which take place either when the child is alone or when he is with others, but which are addressed to no one and are not intended to give information or to solicit an answer. This egocentric speech is a primitive and infantile type of language which, according to Piaget, occupies approximately 50 per cent of the total speech of young children and still plays an important part in the speech of six-year-old children. As the child matures he gives more attention to socialized language, going first through a stage of “collective monologue” in which he talks aloud to himself before others, not talking to anyone in particular but nevertheless being conscious of the audience. The content of such speech is equivalent to the content of the pure monologue, since the child is simply thinking out his actions aloud with no desire to give anyone any particular information.

McCarthy,²³⁰ studying a larger group of children, found egocentric responses occupying only 10 per cent of the speech of children between eighteen and fifty-four months of age, with a decrease in the later years. This wide discrepancy from Piaget's figures may be due to errors of sampling, to a difference in method of collecting and analyzing data or to a difference in the social backgrounds and discipline of European and American children.

McCarthy's study is one of the most careful and scientific studies of the speech of young American children. Three of her conclusions may add something to our understanding of the development of language in young children. She found that: (1) There is a tendency for girls to be more advanced than boys in language development. Decroly⁹⁷ corroborates this for the early stages of language learning, but says that the difference disappears with increasing age. (2) Children who associate with adults show in the early stages of language development a somewhat longer sentence structure and more fluent vocabulary than children who associate mainly with other children. We must not forget, however, the valuable social lessons that can be learned only from other children. (3) As indicated by mean length of response, the hearing of a foreign language in the home does not seem to handicap the child's linguistic development. Decroly and other writers, however, seem to feel that in the earliest stages of language development the hearing of two languages in the home tends to confuse the child, since he must learn two names for each object and each act. Although mentally superior children, being as a rule more facile in language, seem to learn two languages at once with ease, it would probably be advisable to give the average child at least a rudimentary working knowledge of one language before subjecting him to a second.

Language Develops by Fairly Definite Stages.—What seems significant from these studies is that children seem to pass through definite phases of growth in language. In reading about the subject we see frequent references to a "babble stage," a period of "echolalia," "egocentric speech" or "monologue," a "naming stage," a "why, when, where, what" or "question-asking stage," "the sentence forming stage," "the written language stage," and so on. These maturity stages follow along in fairly orderly sequence, some children passing through them more quickly and at earlier ages than others. Plenty of the right kind of language model

is helpful, although too much talking to a child may teach him not to listen when we have something really important to say to him. Nagging is never useful and may arouse unnecessary antagonism. The answering of questions is usually worth the effort unless the child is obviously asking them not for information but simply as a bid for attention or as a means of stalling off some unpleasant task. Plenty of practice with language should be allowed, but there are times when a little of the old-fashioned dictum "children should be seen and not heard" would teach some of our modern children a little more consideration of other people than they now display. Much practice in language takes place when children play with other children, since, although children chatter away to themselves when learning language, they do not talk with the same need to be understood as they do when with other children, nor do they talk as much.*

The Child Makes Many Uses of Language.—In addition to using language in order *to secure information*, children use it almost from the beginning *for the purpose of giving commands or expressing wants*. "Go bye-bye," "mine" and "Bobby wants a drink" are examples of this.

Soon, however, language begins *to serve the purpose of simple narration*. The child tries to tell things that happened to him or that he has imagined. At first these narratives are extremely simple. One two-year-old child who had witnessed an accident in which there had been a good deal of excitement told breathlessly that "Bobby falled out of the bus," but could give no further detail when asked if Bobby was hurt, or who had come to help. His only answer to any question was reiteration of the statement, "Bobby falled out of the bus." At three years these narratives become somewhat more detailed. An occasional three-year-old child can tell a fairly well-connected story: "I went to Grandmother's house. She lives on a farm. I saw pigs and chickens and a baby cow. Grandpa said it was a calf. It walked funny, like this," whereupon an apt demonstration of a wobbly calf-walk is given.

Imaginative elements often creep into these narratives: "I saw a big, black bear. It was in the yard by the lilac bush." Such statements should not be disciplined as untruths, but should be regarded as natural play of imagination and treated in the spirit of play. If direct falsehoods persist and come to be used to escape

* Williams and Mattson.⁴⁰⁸

responsibility or to achieve selfish ends, the situation is different. When such situations arise they should be dealt with clearly in order to keep the child from developing a habit of falsification for selfish ends.

Once the child has achieved a basic language facility, imagination can produce a whole original story: "Once there was a great big engine, and it used to come right up to Bobby's door (the story was told by Bobby to a nursery school group), and said, 'Puff, puff, come out, Bobby, and I'll take you to visit your grandma.' And Bobby went out and climbed in the engine and it started out. 'Puff, puff' it went all the way through the woods right up to Grandma's door." The story goes on to describe how Bobby visited his grandmother, received cookies (a fact doubtless borrowed from reality), found the engine waiting and returned home. This story was repeated many times with a wide variety of embellishments. Sometimes the engine not only talked but waved goodbye as well. The tendency to animate objects is characteristic of the imaginative narrations of young children.

The Importance of Stories.—Many children who do not use narration as an outlet for imagination take great delight in repeating stories that have been read to them. Their memories are often capable of carrying the wording of fairly long stories which they recite with an exactness that sometimes deceives us into thinking that the child is reading from the page. This delusion is augmented by the fact that children sometimes remember even the exact word at which the page should be turned. These recitals are often carried off with a surprising feeling for dramatic effect. The real test of narrative skill, however, lies not in the ability to hold the attention of adults with a story, but rather in the ability to hold the attention of other children. Adults have ability and willingness to understand, even when enunciation is indistinct, the plot sketchy or indifferently pursued. Children, on the other hand, will not listen unless enunciation is distinct and the plot entertaining, consistent and well developed. In many ways children furnish each other with motives for real effort in language performance which adults can never furnish. This gives another reason why young children should play at least part of the time with other children and should not be isolated entirely with adults.

During the narration period of language development children should hear a variety of good stories which can serve as models. There is a good deal of discussion in the literature of child care and

training as to whether children should hear fairy stories or not. Certain children of the unstable, introvert type may be frightened by the more bloodthirsty fairy stories like Jack the Giant Killer. Other children of the same type may find in fairy stories still further material for imaginations already overstimulated. On the whole, however, children, particularly those of the stable and extrovert type, are unharmed by the traditional fairy stories. On the contrary, they usually derive a great deal of joy from them. Probably no writer, however, would recommend a steady diet of fairy stories. Children are too easily and too profitably entertained by stories from everyday life to permit neglect of this rich field. Simple stories about little boys and girls who get up cheerfully in the morning, go to the bathroom and brush their teeth, drink a glass of water, take off their night dresses and so on through the routine of the listener's day will engage the attention of nearly all children from two to four or five years of age. Much that is worth while can be injected into the story by way of an example or moral, but moralizing should never be overdone or it will lose its value.

The Most Difficult Use of Language Is for Expressing Thoughts and Reasoning.—Probably the last use that the child makes of language is expression of thought or reasoning. Part of the explanation for this is doubtless that, although children can reason enough to solve some of their own problems at an early age, they do not often give evidence of the type of abstract reasoning that needs to be expressed in language. Many people think that unless the process of reasoning is expressed in language no reasoning has taken place; but to people who know children it is often evident that reasoning has occurred when the child goes to a certain place to get things, when he builds blocks in a certain way or when he has in some simple piece of behavior demonstrated that he is capable of solving problems and of relating cause and effect. However, the more subtle aspects of abstract reasoning do not usually manifest themselves in gross motor behavior but take place by way of language. Language offers great difficulty to people of any age whenever it is called upon to express the lights and shades of an individual thought process. It is not to be wondered at that children find language useful as a means of giving commands or telling narratives earlier than they find it useful as a means of expressing reasoning.

In spite of the difficulties involved, however, three-year-old

children are beginning to express in language ideas and simple reasoning. One child of three wanted to know, "Where does the milk go when I drink it?" and another said, "I can't wear holes in my stockings when I'm sitting on Daddy's shoulder." Another child of this age upon being told that God made everything and everybody said, "Then, who made God?"

As language skills develop reasoning or thinking is expressed much more clearly. One four-year-old child stood gazing out of the window on a windy day. After a thoughtful pause he said, "Trees moving; wind blowing—trees moving make the wind blow." This is false reasoning, but clearly expressed nevertheless. Another four-year-old child, the son of a minister, overheard several children asking to have the light turned on in a room which had become dark. He said, "God is Light; God is everywhere; we don't need the light turned on here."

Causes for Language Retardation.—There are several reasons why a child of two and one-half or of three years may have failed to make a good beginning in language development.

Deafness.—Probably the first thing to do in seeking the cause for retardation is to examine the child's hearing. It is not always easy to be sure whether or not a child is deaf enough to prevent his hearing conversation and hence to prevent his profiting from the guidance of models in his language learning. Children are extremely quick to compensate for defects of eyes or ears, and may carry serious handicaps for a number of years without the knowledge to themselves or to adults that they are different from other children. The child fails to realize his handicap because, never having seen or heard well, he does not realize that he could be or should be different. The parent fails to discover the difficulty because the child, being nearsighted or deaf, learns to compensate for his deficiency by extra alertness in his other senses. Even supposedly expert examiners sometimes have difficulty in diagnosing sensory defects because the special methods for examining very young children are not widely known, nor is the equipment required generally available. Every effort should be made, however, to determine whether or not language retardation is due to defective hearing.

Defective vocal apparatus is sometimes responsible for inability or unwillingness to attempt speech. Occasionally the trouble lies in the nerve centers which control speech. Rarely the difficulty is one known as *word deafness*—a defect in which although sounds

are heard, the associations necessary to lend meaning to word sounds cannot be formed.

Mental retardation is in many cases the cause of retardation in language development. Many studies of the relationship between general intelligence level and acquisition of language have been made, but the exact degree of association is difficult to state. All studies of feeble-minded children show language retardation, while all studies of superior children show language acceleration. It is safe in this connection to assume that children who talk unusually early are probably superior mentally and that feeble-minded children are always late in talking but it is not to be assumed that all children who are late in talking are feeble-minded.

Inadequate or Defective Model.—Some children of average or even of superior mental capacity are late in talking because they do not have a model which is adequate in amount or in kind. It is a matter of common observation that children who live in institutions for dependent children during the first three years of life are slow to acquire language no matter what their intelligence may be. Wooley's⁴¹⁵ case-study, *David*, is an excellent example of this sort of handicap. David, a child of normal intelligence, at two years and ten months could speak only one phrase, "good morning," and understood little else. He had until this age been in an orphan asylum where he received good physical care, but where no one had the time or inclination to say anything more than "good morning" to the children.

On the other hand, children of superior inheritance and general intelligence are often slow to talk because they are cared for by nurses who do not appreciate the need of talking to their charges, or who, when talking, are limited in expression and often use bad grammar. The marked accents of foreign-born nurses offer another handicap. Add to this the fact that children of wealthy parents seldom have free play contact with other children, and no other explanation is needed to understand why such children are frequently slow in language development.

Occasionally the model for language is at fault because there is too much of it. The parents or nurse may speak too rapidly for the child to isolate from the general flow of conversation any specific and understandable words or phrases. Reasonable speed and clearness of enunciation are essential when addressing young children. In the anxiety to give enough model to their children parents sometimes err by talking too constantly, thus bestowing upon the child

such incessant attention that he learns to expect to be the "center of attraction" at all times; or, if this is not the result, he may become overstimulated and overfatigued—a condition which handicaps rather than facilitates any type of growth or learning.

No Need to Learn.—Occasionally children do not learn to talk because they do not need to learn. They receive such constant attention and affection that they have no occasion to earn it, and their wants are so constantly anticipated that no need to express wants verbally arises.

Limited General Experience.—Some children have enough need for language to help them develop the type of language by which they express wants, but they are so limited in general experience that they have nothing to express in narrative, and are lacking the knowledge of perceptions and judgments which provides material for reasoning. A fairly wide general experience is necessary if the child is to have a desire to express himself and his relation to the world about him. The richness and variety of his vocabulary, the fertility of his ideas and the accuracy of his expression all depend upon the richness and variety of his experience. A home which is rich in language model and in varieties of experience usually provides a desirable background for language growth.

Too Much Urging or Coaxing.—Occasionally parents are over-anxious for evidences of development, forcing the child beyond his ability or rejoicing too enthusiastically over his successes. If a child is urged beyond his ability, realizing that more is expected of him than he can give even though he makes his best effort, he soon becomes discouraged and may sullenly refuse to try because he would rather have it appear that he "won't" than that he "can't." Children need praise for their efforts, for if reproof and correction alone meet their attempts to speak, it is evident that they are likely to stop trying. On the other hand, if too great praise is attached to effort or if rejoicing takes the form of making the child repeat the new word or phrase over for every newcomer, he may become self-conscious or inhibited in his attempt to use the partially formed skill. Sometimes, in this situation, however, he becomes, not self-conscious, but a tyrant. If too great importance is attached to his every word, he may become conscious of his power over his parents, feeling that he can control their happiness by speaking or by refusing to speak.

Ridicule, Nagging or Other Emotional Tension May Produce Stuttering.—Laughing at the child's "cute" accent or his imperfect

pronunciation is particularly dangerous since children are unable to discriminate kinds of laughter and do not always know the laughter of indulgent amusement from that of mockery. Ridicule is feared and hated by young children quite as much as by adults, and a suspicion that the laugh is at his expense may in one dramatic experience kill much of his joy in language. Self-consciousness or fear of ridicule as a rule produces one of two results: either it discourages effort and tends to produce silence or it provides one of the commonest causes of stuttering. The motor control which regulates speech is the finest in balance of any motor control in human behavior; it is the most easily disturbed. It seems more easily disturbed in boys than in girls, since there is considerably more stuttering among boys. One study* showed the ratio of boys to girls among stutterers to be from three to one to eight to one, depending upon the age. Any tension, shock, self-consciousness, fear of ridicule or fear of failure may upset this balance. Stuttering may result from a death in the family, financial strain in the family, overfatigue, the pain or shock of an accident to the child, fear of too severe discipline, unhappiness, emotional conflict or strain of any kind. When due to such causes it can be cured only by removal of the inciting cause. Nagging the child, or calling attention to his difficulty can only make him more self-conscious and more tense, and can, therefore, not cure, but only aggravate the difficulty.

Severe illness, the shock of an accident, the strain of death, worry or unhappiness anywhere in the family may not only produce stuttering but may temporarily inhibit total language progress. One child of two years, already in possession of ability to use phrases and short sentences, stopped talking for over a year when his four-year-old sister died. Whether this was due to his own grief or to a reflection of family tension could not be determined, but it is probable that it would have lasted only a few days or weeks if the family had been able to control their anxiety over his silence. Their worry over his difficulty seemed to convey anxiety to him and to block his efforts to speak. Not until the whole emotional tension could be relieved did the child recover from the fear of failure which had grown out of all reasonable proportion and which completely inhibited his motor speech reaction.

* White House Conference Report. Special Education. D. Appleton-Century Company, Inc., 1931.

Other Causes of Stuttering.—*Changing Handedness.*—Stuttering and retardation in language are sometimes attributed to attempts to change children from left-handed to right-handed motor performance. After twenty years of research the relation between handedness and stuttering is still confused. However, there are several studies* which offer fairly convincing evidence that stuttering is associated with handedness and with motor facility in general. Some authorities† say that interference with natural handedness is the most important single cause of stuttering.

An Aspect of Growth.—One of the peaks of the curve of incidence of stuttering occurs at the stage in language growth where the child has more to say than he has vocabulary with which to say it. One study‡ showed that this is at the stage of beginning to say words for many children, and at the beginning of putting words into sentences for many others. The difficulty at this age seems to occur because of natural aspects of growth. We have seen that at this age the child is reaching out socially and is discovering the use of language as a medium of social communication. Many children find the urge to communicate ideas to others so great that it outruns the active vocabulary. The result is that there is often an urgent need to reach others with language, but a shortage of words with which to do it. Stuttering or hesitation and uncertainty about words results. Fortunately the growth of the active vocabulary, being rapid from two years on, soon catches up with the social growth, and the stuttering disappears, having lasted from two or three weeks to two or three months.

The method of procedure in this type of stuttering is to avoid nagging or anxiety, and to help the child to acquire the vocabulary necessary to meet his needs. This is of great importance, since it is imperative that no negative emotions or lack of self-confidence occur in connection with this temporary uncertainty about words if permanent stuttering is to be avoided. The whole problem is one of keeping the child from becoming self-conscious about his speech, and of helping him to develop the vocabulary needed to facilitate his social expression.

* Brill and Seidemann⁵⁴; Cross⁸⁴; Spadino³³⁹; Westphal³⁹²; Kopp²⁰⁷; Cobb and Cole.⁷⁸

† Orton²⁷¹ and Johnson.¹⁹³

‡ Johnson.¹⁹³

DEVELOPMENT OF REASONING

Do Children Reason?—There is a good deal of dispute about whether or not young children reason. Some writers say that reasoning is a complex mental process impossible for young children; others say that it is a mental process which grades in complexity from the simple trial and error problem solving of animals through the intricate associations involved in the solution of subtle mathematical and philosophical problems. Pierce,^{277a} a writer in child psychology, says that children do not reason before they are seven years old, and that it is, therefore, impossible to discipline them by any method involving reasoning before that time. Most psychologists would deny Pierce's statement. Thorndike³⁶⁷ says that very young children not only possess the requisite elementary processes involved in reasoning, but also the interest in reasoning. He says that in the usual formal schoolroom we discourage reasoning by neglecting their questions, by making them accept mere words as explanations, by feeding to them the dry bones of mathematics and grammar and by teaching them to accept everything upon authority. "It is not the case that interest in reasoning comes late in youth; it comes early, but we restrain and dwarf it."

Young Children Often Reason in Actions Rather Than in Words.—It is evident that reasoning of a rudimentary sort is within the ability of fairly young infants if we consider the following example from Gesell.^{132a} Although not using the term "reasoning," Gesell describes under "adaptive behavior" how nine to twelve-month-old babies recover a cube which has been covered over by an enamel cup. The test is described as follows: "The examiner takes one of the small red cubes and casts it upon the table to entice the child's attention. He may even allow the child to handle the cube for a moment. While the attention of the child is directed to the cube, the examiner swiftly covers it with an inverted enamel cup and placing the handle to the child's right, he notes the first reaction of the child to the cup." Gesell's comment on this test is enlightening: "This is undoubtedly a valuable performance test. Complicating and distorting factors are relatively few. The test is placed near the beginning at each of the schedules when nearly every child is much interested in the red cube. The mental processes required for the solution of this situation follow closely the paradigm of Binet's definition of intelligence, and it was most astonishing to find one six-month-old child who solved the situa-

tion, not only once but six times in immediate succession, exhibiting great zeal and concentration."*

Richardson, Bayley, Bühler and Shirley all studied this type of simple, concrete problem-solving by infants. They agree that pulling a coveted object toward one by means of an attached string is common in babies of one year, and that nearly all children will resort to the use of a chair in order to reach something before they are two years of age. Instances of such solutions of situations can be cited endlessly from random samples of observations of the behavior of children from a few months of age through childhood. Whether or not young children reason is then not an argument of fact, but a dispute over definition.

Successful Discipline Depends upon Our Understanding of the Extent to Which Children Reason.—If we agree that a child reasons, we shall not limit our discipline to the use of arbitrary force. We shall, rather, discipline him at each age level with increasing use of his reasoning capacity. One mother gives the following as an example of the use of reason in the discipline of a four-year-old boy: "Four-year-old Tom came into the house the other day with muddy boots and marked up the entire kitchen, turned about and remarked it, seeming to enjoy the procedure immensely. I do not spank for such offenses, but insist that the damage be repaired. Tom knew this; so when he had finished his parade he immediately found cloths and set about cleaning up. He had not, however, realized that the joy of a few moments would exact in payment the whole of his play period. When he had finished his work he gave evidence that he had put cause and effect together as he announced, 'I guess I won't go out in the mud again.' Going in the mud gives Tom great joy; I am sure that if physical pain, e.g., a spanking, had been the only result of his escapade he would have found the fun of the mud even stronger than the fear of pain, and would have continued to play in the mud. If physical pain is the only consequence of undesirable behavior children soon become callous to it, but the logical consequence of an act means constantly fresh experience—it commands attention, it exercises reason, it lengthens memory. Moreover, logical consequence is better than spanking, because life does not spank, but rather, exacts logical payment for error. Tom is not too young to learn this."†

* Gesell^{132a}(p. 113). By permission of The Macmillan Company, publishers.

† Mrs. Arthur Colten. Taken from an unpublished statement.

Examples of Various Types of Reasoning Shown by Children.—Most children of twelve or fourteen months have discovered that they can bring a dish on the table nearer by pulling the whole table cloth toward them; they have discovered the relation between tilting the bottle and getting more milk; they have made the association between having a hat on and going out-of-doors. Long before twelve months they have discovered the relation between arm movements and the noise produced by a rattle, between releasing their hold of a ball and its falling on the floor. These are all examples of an understanding of *cause and effect*.

Generalization and application come somewhat later; and it is possible that the slow development of these capacities has led some writers to conclude that all reasoning capacity is late. One need only to watch young children casually to conclude that their ability to generalize is not well developed. They must meet many specific situations and must be told about numerous specific instances before they are able to draw conclusions from them. The story of Skee-zix and Pal, his dog, in the comic strips, illustrates this. Skee-zix was discovered using his toothbrush to scrub Pal's teeth. Uncle Walt tried to impress Skee-zix with the seriousness of his offense and concluded, "Skee-zix, you must never use your toothbrush on Pal." A few minutes later Skee-zix was found scrubbing Pal's teeth as before, and upon being reprimanded said, "But, Uncle Walt, this is your toothbrush." Uncle Walt should have generalized for Skee-zix, pointing out that no toothbrush should be used for anything but to brush the teeth of the person to whom it belongs, and he should have explained as much of the reason why this is so as Skee-zix could understand.

Only by giving children information in numerous specific situations, by teaching them the reasons for behavior in many specific instances and many times drawing conclusions in such a way that they can understand the process, can we help them to the technic of generalization. The young child has not met situations in sufficient number to permit a cognizance of the similarities and differences by which general classifications are made. He does not realize, for example, that combs, toothbrushes and wash cloths belong to the general class of "personal belongings" and are things that each individual uses for himself alone; whereas most chairs, books and other household furnishings belong to the general class of "family belongings" and are things which can be used by the family at large. Personal belongings are alike in the fact that they

are used in the care of the person, and are different from family belongings as a class.

Experience Is Necessary as a Basis for Correct Generalization.—

As the child gains experience with a wide variety of situations, he becomes familiar with the elements of each, and gradually comes to discover how nearly similar or how widely different the elements in several given situations must be to permit classification or generalization. We can help him in this by extending his general experience, and by pointing out to him the essential similarities and differences upon which classifications are built. This must be done gradually, however, since young children are usually more confused than helped by detailed explanations and complex patterns of thought, and can reach only the simplest and most obvious conclusions. It is important to realize in this connection that many of the experiences and conclusions familiar and obvious to adults are new and strange to young children; the very strangeness of details often requires the child's entire attention at times when we expected his attention to be occupied with conclusions.

Experience Is Also Necessary before General Principles Can Be Applied to Specific Situations.—The child suffers a similar handicap in his attempts to apply general principles to specific situations. He lacks experience, and hence often cannot decide whether or not a given situation comes under a general ruling, or, still more often, he does not even try to decide since the association between situation and principle never occurs to him. We explain to a three-year-old that he must remove his galoshes before entering the house because they track mud over the floors. He seems to understand and abides by the request for several weeks. When the weather becomes less severe, however, and galoshes are replaced by rubbers we are surprised one day when, apparently forgetting our request and his own good habit, he appears in the house wearing rubbers and leaving muddy tracks behind him. He is puzzled when we ask if he has forgotten that muddy overshoes are not to be worn into the house, and replies, "But, mother, you said galoshes. You didn't say anything about rubbers."

Wishful Thinking Common in Children.—The child's inability to generalize and to apply principles is also due to a habit of mind which leads him to think what he wishes to think rather than what the situation demands. Wishful thinking, as this is called, is a characteristic of immaturity, and is found not only among children but among adults who, although often brilliant in mental ac-

complishment, may be immature in personality. The child, wearing his rubbers into the house because he has misunderstood the generalization involved, may have thought that rubbers were not included in the rule partly because he wished to think it. Four-year-old Betsy illustrated this type of wishful thinking when, during a game of papa and mama, the papa wanted a gun which she had found. She carried her point by saying, "No, you can't have it because I'm the mama and mamas carry the guns." In such an instance the child is not to be condemned for compromising with truth, nor even for a refusal to face facts, but should, rather, be led to see her error and aided to clearer thinking in the matter. If personality and mental growth are progressing on a basis of increasing independence and experience, the child will eventually outgrow the part of his wishful thinking which leads him to errors of judgment.

Problem Solving, an Important Type of Reasoning.—Probably the aspect of reasoning most universally agreed upon among writers as real reasoning is that of problem solving. Whenever a new situation for which the individual has no habitual reaction presents itself, the individual is said to be faced with a problem. As long as life flows along familiar channels where no new or unaccustomed action is demanded, habit serves all needs. But whenever a strange situation arises, habit is powerless. A new solution or a new pattern of action is needed, and reasoning becomes necessary. The steps in such problem solving are usually listed as follows:

1. Location of the problem and determination of its nature.
2. Survey of possible solutions.
3. Selection of the most promising solution.
4. Trial of chosen solution.

An Example of Problem Solving by a Three-Year-Old Child.—These steps of reasoning are illustrated in an incident which occurred in a nursery school where each morning the children have tomato juice served in small dessert glasses. The glasses were being served from a low serving table to children seated in groups of four at individual tables. One child from each table was serving his table. Jimmy, aged three years, having been chosen to serve, carried glasses from the serving table to his individual table until everyone in his group had been served. But he did not count correctly and appeared at his table carrying a fifth glass which he discovered was not needed and had to be returned to the serving table. Meanwhile

the children at all the other tables had been served, had drunk their tomato juice and had returned their empty glasses to a serving tray. Upon reaching the serving table Jimmy was faced with a problem: He must return his extra glass of juice to the serving tray, but the tray was full of empty glasses. He achieved step one in reasoning immediately: He realized where his problem lay and could see exactly what the nature of his problem was.

He surveyed the situation (step two) as he stood holding the glass of juice and trying to figure out what he could do about it. An idea which promised to work occurred to him (step three); and he took the glass by its handle and tried to use it as a pusher (step four), pushing the other glasses about in an attempt to crowd them a little closer and thus to make room for his glass. This solution failed. He returned to step two, considering other possible solutions as he stood thoughtfully holding his glass. Once more an idea occurred to him (step three), and he tried (step four again) to pile his glass on top of one of the empty glasses on the tray. But the handle on the side of his glass caused it to tilt, and threatened to spill the juice. At this point experience with similar situations led him to realize that this solution was a failure because, although putting his glass of juice on top of another glass would get his glass on the tray (one aspect of his goal), it would spill the juice and thus defeat another important aspect of his goal.

Once more he stood holding his glass as he surveyed other possible solutions (another return to step two). Suddenly his face beamed. Apparently he had discovered another possibility (step three). He reached out and poured his juice into one of the empty glasses thus "saving it," and triumphantly set his now empty glass upon another thus getting it upon the tray. It could tilt now with no loss of juice. In his own mind he had achieved success in his problem.

Experience Is Necessary to Successful Problem Solving as Well as to Other Forms of Reasoning.—Jimmy's lack of general experience caused him to lose sight of one important factor in his problem. He did not realize that tomato juice poured into a used glass was not in reality saved, but must be thrown away. It is interesting to note, too, that this complex piece of reasoning, illustrating clearly every step of problem solving had taken place without a single word of language. It is clear that the ability to perform these steps of reasoning depends upon a general experience which places the individual in possession of a variety of facts, and which permits

an accurate interpretation of facts in terms of their proportionate importance.

Necessary, also, is the experience in the special technic of reasoning, namely, in the technic of analysis and synthesis of facts. An important contribution to the child's mental growth can be made if we permit freedom for wide experience with things, with people and with situations. We must give him opportunity to solve his own problems, to do his own thinking whenever the situation involved is simple enough to permit a reasonably sound solution from the background of his limited experience, or whenever the risk of a wrong solution is not too great.

Experience Basic to Correct Reasoning Can Be Given Early.— If, for example, the eight-month-old baby drops his rattle, he is faced with the problem of recovering it. Unaided, he will make a variety of attempts to reach it, and will learn valuable lessons in the art of trial and error and of finally selecting a good solution (steps two, three and four of problem solving). Moreover, if he succeeds as a result of his own effort he has the satisfaction of finding his own solution, and this will make him more eager to attempt solution of the next problem that confronts him. If, however, we rush to him when he drops his rattle, restoring it to his grasp before he has had an opportunity to sense his problem, we rob him of an excellent chance to learn a valuable lesson.

If when he is eighteen months old, we permit him to handle his own spoon or cup, he will soon select from all the possible ways of holding them, the one or two ways which solve the problem of giving him food or drink successfully. If at three years he is permitted to cope with the problem of getting his blocks into a box, he will soon learn the best way to fit them together. Consider the problem of an eighteen-month-old child who has been playing horse and who has been running about dangling the reins behind him. He gives his imagination free play until the reins catch over a stake in the ground, thus impeding his progress. He is now faced with a problem. At first he is likely to behave much as an animal would under the same circumstances; he tugs and jerks at random, trying to pull himself free. If he has not the habit of attacking his own problems he will probably set up a lusty cry when he fails thus to free himself, expecting some adult to solve the situation for him. If, on the other hand, he has become accustomed to facing his own difficulties, he will probably pause in his struggles, examine

the situation, discover that he must back up in order to release the reins, do so and thus extricate himself.

Shifting Attention of Children Makes Reasoning Difficult.—The character of children's attention as well as the limited experience of young children makes accurate thinking difficult. Children are likely to make certain characteristic errors in reasoning because their attention is too unstable to permit concentrated thinking. In spite of the fact that young children often give sustained attention to concrete materials for long periods of time, they seem on the whole incapable of entertaining abstract ideas in any appreciable sequence or for any long period of time. They may have all the necessary facts for solution of a problem, but unless some progress toward solution becomes evident fairly soon, they are likely to lose sight of the goal, or are likely to become distracted by some trivial aspect of the problem.

When to Help Children in Their Thinking.—It is a fairly good rule to let children work on problems unaided if there is some appreciable chance that success will come with reasonable effort, but to give aid rather than to allow failure to occur too often. Failure means dissatisfaction and an increasing unwillingness to attempt solution of problems, whereas success, especially success which comes as a reward for one's own effort, is a keen stimulant to further attempts. Aid should be given, too, whenever it becomes apparent that lack of motor ability or lack of ideas is about to produce discouragement leading to abandonment of the attempt, or irritation resulting in an explosion of temper. The child should not learn the habit of failure because he is too often faced with problems too difficult for his ability; nor should he give up problems before reaching solutions because solutions are too long delayed. He should not develop a habit of explosion in temper because the drive for success outruns his motor ability. He should learn none of these things from his experience with problem solving; but he should, rather, through ample experience with problems within the scope of his ability, develop habits of success, of persistence, of versatility in thought and, most important, the habit of attacking his own problems willingly.

Reasoning Expressed in Words as Well as Actions.—At three years the child begins occasionally to express his reasoning in language, and at four he gives many examples of verbal reasoning which, unless we realize how usual this is at four years, may lead

us to consider him unusually precocious for his years. It is not at all unusual to hear children of three years reason as did Barbara whose playmate, Blanche, looked out of the window at heavily falling snow and said, "Oh, see the feathers." Barbara said, "They're not feathers, are they?" and received from an adult the answer, "No, Blanche is using her imagination." Barbara was apparently much impressed with the word "imagination" and went about repeating it over and over. Later in the day she said, "If Blanche had said, 'That is snow,' would that have been imagination?"

Learning to Make Decisions Is Necessary to Mental Health and Should Begin Early.—Decision-making is an essential part of step three in problem-solving, and like all other aspects of reasoning, depends for its development upon practice and success. Adults who have never learned to make decisions find themselves seriously handicapped because of the trait of indecisiveness.

How to Make Decisions.—1. When, for example, a decision is pending between choices A, B and C, it is necessary to examine all the advantages of A, of B and of C, and also to take account of all the disadvantages of each.

2. The advantages inherent in choice A must be weighed not only for number but for importance against the advantages inherent in choices B and C, and also against disadvantages in choice A; the same must be done for B and C.

3. The individual making the decision must choose, knowing that by virtue of his choice he is giving up the advantages of the choices he decides against, and accepting the disadvantages of the choice that he decides for along with its advantages.

4. The individual must believe in his decision sufficiently to act upon it.

Causes of Indecision.—This sounds complicated in a discussion which deals with young children who do not, of course, make decisions "by technic." But if we are to aid them we must understand something of what is involved. Indecision may be due to failure in any of these steps.

In step one the individual may not know enough about the facts which are relevant to his decision to enable him to lay them out for examination. Or, he may not realize when he has gathered enough relevant facts to warrant a decision; or he may use as a way of delaying the effort of final decision the excuse that he has not yet enough facts.

In step two failure may result because of insufficient general knowledge upon which to base a judgment as to the importance of the various advantages or disadvantages involved. The individual may, in other words, lack the items of experience necessary to an evaluation of the advantages and disadvantages inherent in his present situation.

The most frequent failure in decision-making, however, lies in step three. Too few people have the strength of will to face the necessity of giving up advantages and of accepting disadvantages once a decision is made. They refuse to accept the fact that any decision necessitates the sacrifice of certain advantages in favor of others, and the acceptance of certain disadvantages. Indecisive people are often indecisive because they lack courage—courage to give up one set of advantages in order to gain another, courage to accept disadvantages which inevitably accompany advantages. Courage of this sort should be learned early, and is probably the chief reason that children should have experience in decision-making while they are still young.

The strong belief in a decision which is spoken of in step four of decision-making and which is necessary before that decision can be acted upon, offers the final pitfall for the indecisive person. Many people can go through the pretense of decision-making as far as step four, can delude themselves and the world into thinking that a decision has been made, yet can procrastinate until the test of action never comes; and so, by this procrastination, they can indefinitely postpone the actuality of decision-making. No decision is really made until it is acted upon, nor can any person who fails to act because he continues to wonder whether or not he has made the right decision be said to have made a decision at all.

Practice in Decision-Making Is Necessary.—Children need practice if they are to learn decisiveness. They need to make the many little decisions apparently trivial to adults, but important to them. “What shall I play now?” “How can I make this tower of blocks stand straight?” “Where shall I keep my dollie?” Such decisions should not be made by adults but should be made by the child himself. He should have hours every day when the decisions of play and of simple routine living are entirely his responsibility. Every decision for which he has sufficient experience and judgment should be left for him to make.

The Types of Decision We Allow Children to Make Must Be Adapted to Their Ability.—Children should not, however, be per-

mitted to make decisions in cases where they lack such experience, or where the consequences of a wrong decision would be too serious. The consequences of a too serious mistake may frighten a child away from attempting to make his own decisions again. Nor should the child be permitted to think that he is making decisions when in reality he is not; when, for example, we lend so great a weight from our own opinion that he is unduly swayed toward a decision which is not really his own but which he considers his own because he has phrased the final statement regarding it.

Neither should he be permitted to make decisions which he promptly retracts without appreciating that he has failed to act upon them. One mother, thinking she was training her two-year-old son in decision-making, approached him each morning and said, "Son, will you climb out of bed yourself this morning or shall mother lift you out?" The boy would answer, "You lift me out"; but as she approached to do so he would say, "No, I'll get out"; as she retreated, "No, you lift me"; and the process continued often as long as fifteen minutes. This child obviously was not learning decisiveness, but rather indecisiveness and an unwarranted sense of power over his mother. If she wished to train him to make decisions she should have acted upon his first request promptly and in spite of any desire on his part to change his mind.

Snap Judgments Should Not Be Confused with Sound Decisiveness.—In this connection it should be remembered, however, that when training a child to make decision we must guard against letting him acquire the habit of making snap decisions under the delusion that he must decide all things quickly. Sometimes, led into error by America's slogan of efficiency, we force decisions, either in cases where sufficient facts are not available, or in such haste that whatever facts are available cannot be adequately considered. Many people consider themselves decisive when as a matter of fact they are only artists at snap judgments. It is probably better to be indecisive and to know it, than to consider oneself decisive and forceful when one is really only reflecting the opinions about one or is jumping to ill-founded conclusions.

DEVELOPMENT OF IMITATION AND IMAGINATION

Children Tend to Copy Some of the Things They See Around Them.—There is some dispute in the field of psychology as to whether children imitate movements that they see or sounds that they hear as the result of an instinct to do so or as the result of

chance learning. Most writers on child care and training, however, seem to assume that at least part of the child's tendency to duplicate the behavior and attitudes of those about him is due to a conscious imitation of model. Close observation of infants may reveal instances of direct imitation of movements before nine months. Gesell says that a new capacity for imitation develops at around nine months, and that the year-old child may be a prodigious imitator. "Demonstrate the ringing of a bell and he will wave it furiously by way of social reciprocity." At fifteen months the child enjoys imitating smoking, coughing, nose-blowing, sneezing and other such activities. Excellent use can be made of this for teaching him to cover the mouth while coughing, the way to blow his nose correctly and so on. By fifteen months "bow-wow," mewing like a cat, "peek-a-boo," "pat-a-cake," imitative crushing of paper and throwing a ball all are familiar in behavior. "Bye-bye," imitative combing of hair, kissing of a doll and scribbling with a pencil are also common at this age.

By the time most children are two years old they begin to show us our own mannerisms. One little girl learned to greet everyone with the same swinging gesture and the same strident-voiced "How's evabody?" that her father used. Many mothers learn for the first time of the querulous tone which creeps into their "discipline voices" when they hear the three-year-old child disciplining her doll in careful imitation of the adult manner.

The Model is of Great Importance.—From two years onward we find play time much occupied with "housekeeping," "traffic cop," "hospital," "shopping tours"—play in which the child duplicates as faithfully as he can the activities, gestures, tones and other incidents of adult behavior which have happened to attract his fancy. He is rude with the rudeness of adults whom he admires, or courteous with the easy grace of the fine example of those whom he loves. He speaks clearly and accurately, or mumbles bad grammar and profanity; he is neat or untidy, quiet or boisterous, truthful or sly, at least in large measure according to his example. Whether he reproduces the behavior and attitudes of the people about him by instinct or by selected habit is not so important to our consideration as is the fact that he does reproduce. The best way to teach courtesy is to be courteous before the child and to him. The best way to teach good English is to speak it to children while they are in the early learning period of language development. The best way to teach good attitudes toward health, au-

thority, truth and society is to have good attitudes ourselves, since children reflect the subtleties as inevitably as they imitate our more obvious gestures and tones of voice.

The model for imitation may not, of course, always be the parent. It will, however, always be someone whom, for some reason, the child loves or admires. This will be the parent or nurse until the child begins to meet other people. As contacts widen, potential models become more numerous. The strident profanity of a truck driver in the street may appeal to the child as "grown-up" and prove an attractive model. The pranks of the neighborhood "bad boy" may receive so much attention and create so much excitement that they appeal to all the other children in the neighborhood as worthy of duplication.

It would be a mistake to protect the child from all undesirable models, for, unless he has some experience in the selection of standards, he can scarcely be expected to use good judgment in the matter when he no longer has his parents to think for him. He should not, however, be overwhelmed by too sudden or too constant exposure to undesirable models, but should rather have a gradual experience with them, being constantly exposed to enough attractive and desirable models, either in life or in literature, to keep the balance a favorable one. Parents, being his first and his most constant models, have a great balance of power in their favor, especially if they are skillful enough to make themselves effective in this capacity.

Development of Imagination Important to Many Aspects of Growth.—Much as the child imitates the models around him, every child adapts what he takes from his environment not only to his own inner pace of growth (or maturational patterns) but also to that inner faculty of personality and imagination. As was pointed out in the discussion of the development of speech, for example, children take words, often use them correctly for a short time and then adapt them to their own developmental pattern. They listen to stories, then dramatize them according to their own interpretation. As will be pointed out later, each child has an inner pattern of personality or emotional tone which colors the ideas that come to him, and the manner in which he reacts to the world around him. Thus he creates the world in terms of his own inner life, and absorbs from life the things he needs in order to fulfill his inner development. He also expresses back to the world varying interpretations and evidences of his own inner personality. He is

creative, in this sense, just as he is in the things he does with paints and clay, with rhythms and bodily movement and in story-telling and dramatic play.

Ability to express imagination with any fluency, however, depends upon the acquisition of controls over the body, upon accumulation of knowledge which will permit one to judge and to handle objects intelligently (sense perceptions and judgments), upon language facility and upon increasing capacity to have ideas (reasoning). It is easy to understand, then, why the child's ability to express himself in what people usually regard as imaginative or creative behavior should increase steadily with age, at least in the early years of life,²⁴⁵ and why the relationship between imaginative behavior and mental age is close enough to be demonstrated statistically, the more intelligent children showing a somewhat higher amount of imaginative play. In this capacity of imagination, as in many areas of growth, there are no appreciable sex differences, since both boys and girls display wide variations from child to child and neither boys nor girls seem in the main to have more capacity in this direction than the other sex.

Imaginative Behavior Must Adjust to the Real World.—As will be pointed out later in the discussion on emotion, life in our society is such that one cannot give full vent to one's imaginative tendencies. The pre-school child's great capacity to express himself as he wishes in play soon gets discipline from two facts: as he grows older he must learn to work instead of to play all the time; and his fantasy world, constructed to suit his own desires, must increasingly as he grows older be adjusted to the world as it is in reality. However much one may wish certain things to be, one often has to yield to the cold facts of things as they are. Thus there can be seen in the development of the child's imagination, first the crescendo of increasing ability to be imaginative or creative and to express this, a peak time when imagination seems to occupy more time and energy than the world of facts; then a gradual diminuendo, as life forces the acceptance of the idea that one must adjust to the real world of routines and of other people's needs and desires.

What pattern the crescendo will take and how long it will last will depend upon the motor skills, language facility and other requisite maturings of the child and upon the speed and force with which his parents introduce him into reality. The problem for parents and educators becomes one of fostering the desirable as-

pects of creative imagination and of inner resourcefulness and initiative on the one hand, while at the same time teaching the child to cooperate with the necessary routines, to tell the truth and to face facts realistically, one of the most important of which is to learn to be aware of and to adjust to the rights and needs of other people. In most children's lives as they live with and adjust to most sets of parents, the pattern of imaginative behavior begins gradually at about one year to eighteen months, mounts rapidly



Fig. 51.—Almost two years old, this somewhat advanced child enjoys an imaginary telephone conversation with his mother who talks to him from her work in the next room. His own table and chair and play corner give him a comfortable sense of having a place in the household.

from then to three or four years and remains at a fairly high point for several years until around ten or twelve years of chronological age, gradually tapering off into the mature pattern of desirable balance between imagination and adjustment to the real world.* At around three years many children discover the fun of such dramatic play as living out simple stories by playing that they are Little Black Sambo, or of playing mother or father in the role of

* For discussion of what this balance is see: Ryan³⁰⁸ and Sherman.³²³

housekeeping. The child's doll becomes a live baby at this stage; a row of blocks becomes a train; he pretends to eat sand pies and cakes with gusto.

Imaginary companions are frequent, especially if the three or four-year-old child is deprived of the opportunity to play with other children at this stage of his social development when other children are becoming important to his growth (recall here the effect of companionship on his language development). Even in nurs-



Fig. 52.—Two and one-half years old. The sand pie is being tested to see if it "is done." Note the separate finger dexterity of the right hand.

ery schools, however, imaginary companions are common, since children often feel compelled to provide a baby brother or a parent who has characteristics which can compete with the attributes of those some other child boasts about. Some adults deal with these imaginary companions as if the child is lying and therefore requires severe discipline. Other adults think they are delightful manifestations of imagination and hence encourage the child to talk about them, or may join the child in play with them. Neither the ex-

treme of denial or of treating the imaginary situation as if it were real is wise.

All imaginative play fills some kind of need in the child. It should be permitted expression and outlet. Even exaggerations of fact and apparent lies should be dealt with gently until they prove to be truly selfish or malicious distortions of fact, since these exaggerations and apparent lies are usually innocent expressions of imagination or the confusions of imagination with fact in young children. Exaggerations or distortions should not be encouraged unless the child is obviously enjoying the game and obviously expects us to realize that he is only pretending, in which case we may safely join him in the play. The correction of this type of imagination should come when the child obviously fails to discriminate between what he imagines and what is real, or when he is obviously trying to fool us or win an undesirable advantage through the lie.*

Widening Horizons for Children.—Imagination is the faculty of mind behind any understanding of an experience one has not actually had, or behind the capacity to feel how other people must be feeling when one sees them or hears about their being in a situation one has not actually lived through oneself. Children should be helped to develop this quality of their minds which can carry them beyond the limitations of their own personal experience. Dramatic play in which they imagine themselves in someone else's situation helps this. Being read to about stories of animals or other little boys and girls also helps. The possession of live animals to be interested in and to care for helps, although children under six rarely prove capable of being entirely responsible for the care of any animal. Occasional trips beyond house and yard should include new and interesting things to think about and to ask questions about.

Some parents, in an eagerness to provide adequate challenge to growing motor skills and developing intellects, make the mistake of providing too many toys, or of planning the child's time too completely, trying to see that no hour is lost educationally. An overcluttered environment distracts and confuses children. A year-old child should have only two or three things at a time in the play pen; two to five-year-olds concentrate best when there are not too many choices of activity available. One should remember, however, that children should have a sufficient variety of choices in

* For a more detailed discussion of children's lies and other undesirable forms of imagination see Breckenridge, M. E., and Vincent, E. L.,⁵² pp. 353 ff.

order to leave the way open for them to choose according to their own needs. Toys should be the simple "do-with" toys which the child can use in a variety of ways and around which he can develop imaginative play. Adult supervision should be sufficient to keep him safe from injury, but not so close as to interfere with the free play of initiative and imagination.

Development of Children's Paintings.—As an illustration of the type of maturity stages through which even creative abilities seem to grow, let us consider the development of children's paintings.

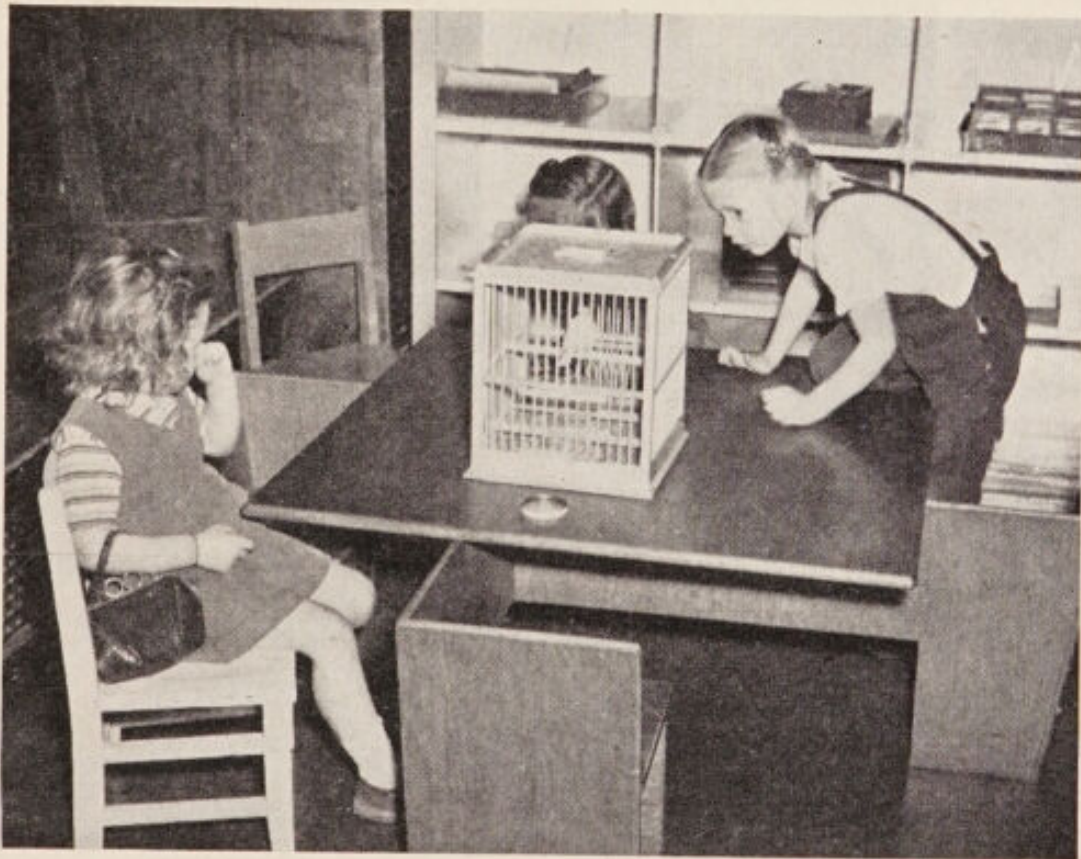


Fig. 53.—Live animals widen the horizon and imagination for four and five-year-old children. The interest created here is evident.

Given the requisite motor and intellectual maturities, children nearly all enjoy an opportunity to play around with poster paints (which wash out of clothing if spilled) and paper. Few educators of young children attempt to force this play into the more formal lines which used to characterize the teaching of drawing and painting in all schools, and still does characterize it in most schools above the primary grades. Many adults today can recall how the pure joy of handling paints or clay, or of experimenting with a piano keyboard was ruthlessly squashed by the parent or teacher

who either insisted that one "stop that messing," or forced one to "copy the bunch of carrots exactly as it is." We now know that free experimentation with the various art media, of which the piano keyboard is one, leads many children through certain preliminary stages of creative development which prove to be a sound foundation for later formal teaching. Even more desirable than the building of the sound basis for formal teaching, however, is the pure joy the child comes to associate with the use of the art me-



Fig. 54.—This child, not quite four years old, is in Stage 2 of her experiments with paint.

dium. If he learns to love what he is doing, he will later work intensely through the endless hours of "developing the technics" which most formal teachers rightly insist upon.

Many two and three-year-old children, properly covered to protect clothing, and placed in an environment where spills are not serious, will spend long periods at "painting." Given freedom to experiment as they will, nearly all children pass through rather definite stages in their use of this art medium.*

* Beach and Bressler³⁴ describe these more clearly than most writers.

First, there is relatively uncoordinated scrubbing and sweeping about with the brush, spreading color on the page, learning not to drip the paint, not to scrub through the paper and mastering other such elementary factors. Body movements are random. Results are chaotic and are not intended to express anything more significant than sheer joy in color and activity.

Second, there is more coordination of body movement. Lines, strokes and distinct color areas appear. An accidental design may develop, and may be the product of an interruption in the work or a disturbance developing from a paint run or a blot or other distracting occurrence. Even a slight shift of the child's mood may change the tone or the intention of the activity.

Third, consciously sought design appears. At this stage most children implicitly fill up the whole page before announcing themselves as "done." The design is often conscious in the sense that it develops as the painting proceeds. This is a transition from no design to preplanned design. In this stage certain areas of the painting often emerge and call for a plan of design. The child often plans one area to balance another accidentally developed area.

Fourth is the stage of preplanned design, in which the child deliberately sets out to paint "a man" or "a house," these two being the most frequently announced subjects of first consciously planned paintings. Some children who have had plenty of opportunity to progress through the earlier stages arrive at this fourth stage as early as four or five years. With less opportunity most children do not arrive at it before six or seven years of age. Inexperienced children of six or seven will be likely to scrub in a sky or other large area in their pictures, or they may start to paint a scene and lapse into pure design. These children show by this that they need more experience in the earlier phases, and should be given freedom to experiment with these phases as they feel a need to do so.

The fifth and mature stage of painting is one in which the idea or feeling is more highly developed, and expression is more purposeful than in the earlier stage. Increasing perfection of art techniques and skills move forward in this stage, but according to students* of children's art, there is no further development in the basic approach to painting.

Children do not move smoothly through these stages, some skipping backward and forward. They spend varying lengths of

* Beach and Bressler.³⁴

time from two weeks to two years in each stage, depending upon inner maturational factors and opportunities to practice.

The Development of Musical Ability.—Although children seldom develop any capacity which would be considered musical in the sense of performance on an instrument in the preschool years, much growth occurs which lays the foundation for the enjoyment or the performance of music in the later years.* In the singing field, especially, much can be done in the earliest years of life to prevent the development of monotone singers which teachers of elementary schools find so frequently among their pupils. In one study of three-year-old children† it was found that training caused a marked improvement in the number of notes and intervals the children could produce. In another study of three to five-year-olds,‡ it was found not only that ability to sing improved noticeably with training, but also that interest, satisfaction and enjoyment increased as ability improved. Training seemed to give the children more self-confidence in singing, more interest in learning and more enjoyment in participating in group musical activities. Preschool training in music activities seemed to carry over into school music activities, and interest gained seemed to persist. These are, of course, the achievements of average children in the ordinary activities of a nursery school musical program. There is substantial evidence that any above average or genuinely unusual musical performance is dependent upon above average or unusual inherited gift§ and cannot be forced through teaching. Ordinary ability to beat rhythms and to move the body rhythmically is more dependent upon inner maturational factors than is the average ability to sing. Much can be done, however, to help children to sing if songs are presented to them in the voice range natural to them. Jersild and Bienstock,|| whose work in the study of the musical ability of young children is outstanding, have found that children have the following numbers of notes in the voice range at the given ages:

* Music, like the learning of language at the reading and writing stages, seems to be an area of learning which, although dependent upon inner maturational factors and upon the possession of a modicum of talent, is subject to teaching.

† Jersild and Bienstock.¹⁹⁰

‡ Updegraf et al.³⁷¹

§ Scheinfeld.³¹³

|| Jersild and Bienstock.¹⁹⁰

Age	Number of Tones in Range
2.....	5
3.....	7
4.....	9
5.....	10
6.....	13

This shows a rapid development of range through the preschool years, and permits the singing of many songs if they are written in the proper range. The two-year range included D, E, F, G and A above middle C. By three years, middle C was included, and at six years the range included the scale from A below middle C to the second G above middle C. Ascending notes from middle C to A are sung readily by very young children and narrow intervals are sung more readily than wider ones.

Appreciation of and Response to Music.—Although there are tremendous differences among individual children in capacity to enjoy and to respond to music, most children of three years have learned to recognize a few simple tunes, can beat a fairly good simple rhythm, and can detect the difference between high notes and low ones, between slow and rapid rhythms and between loud and soft intensities in music. In this, as in all other aspects of learning, skill depends not only upon original endowment but upon opportunity to learn as well. In some homes where children hear a great deal of music, sharing it with people who appreciate it, they learn a genuine appreciation at an early age.

Advance in the appreciation of music and rhythm is rapid from three to five years of age. Ability to discriminate pitch, timbre, intensity and interval, as well as skill in pitching the voice all grow quickly if the child has any special ability in this direction and if practice is given. Some children of three or four years have a response to rhythm which enables them to stamp, march or sway in perfect time to simple music. A few can beat drums, clap cymbals or shake a tambourine accurately enough to accompany music. There is danger here, however, in the temptation to teach children "parlor tricks" in music. Many four-year-old children, having only a slight gift in music, can be taught to sing dozens of nursery rhymes or to dance an entertaining variety of jigs to music. Average or slightly superior children can, if sufficiently coached, be taught to recognize scores of victrola or piano selections, reciting even long French or Italian names glibly before they are four years

old. This sort of thing gives the impression of great precocity; it sometimes even deludes us into expecting brilliant musical futures from such children.

The Surette School of Music at Concord, Massachusetts, made an admirable contribution to the teaching of music for young children when it took a stand against such artificial performances as those cited above. Mr. Surette believes that a feeling for music is more important than the mechanics of performance. Too great an emphasis upon academic memory tricks or upon mechanical reaction to music, he thinks, often interferes with true appreciation of music. Children must "experience" music with their minds, their bodies and their emotions. He advises letting children hear good music, sometimes listening quietly, sometimes expressing themselves in bodily movement; but "coaching" should be avoided until the foundation in appreciation has been laid.

Individual Differences in Creative Capacities.—Children differ widely in native gift in the creative areas of intellectual development, some children having little or no interest in music, painting or the crafts, while others have outstanding gifts in one or more of these fields. Given a reasonable exposure to the possibilities of expression in any one of these areas, the child himself will reveal what his native gift is by the interest and concentration he displays. Poor teaching will sometimes discourage a child by forcing him into the wrong patterns of expression, so that occasional genuinely gifted children may refuse "to practice" for their lessons. If the teaching is even reasonably well adapted to the growth patterns of the child, however, the gifted child seldom, if ever, needs to be urged to practice.

MEASUREMENT OF INTELLIGENCE IN YOUNG CHILDREN

For a number of years attempts have been made to measure intellectual development in very young children. Parents are interested in early evaluations of their children's intelligence so that they can look forward to proper schooling. Often they are seeking reassurance when there is doubt as to whether or not the baby's development is normal. Parents contemplating adoption of babies are, of course, very anxious to have an evaluation of the child's future capacities.

Gesell,* at Yale University, has evolved a developmental scale with standards for one month and intervals thereafter. These

* Gesell¹³³; Gesell and Amatruda.¹³⁴

standards are, however, in no real sense a test of intelligence *per se*. They are, rather, evaluations of the general developmental level the given infant has achieved at the time of evaluation. Gesell and his co-workers have refused to call their scale anything but a developmental scale, and have purposely avoided translating this scale into any form which could be regarded as a mental age scale.* Bayley,^{30a} at the University of California, has published a Scale of Motor Development which is standardized for infants. Several other tests or sets of standards for use with infants have been published.†

Research has shown, however, that these tests of very young infants cannot be relied upon for prediction of future mental ratings. Results of tests on children under two years of age do not correlate closely with tests made at later ages, nor do the results of one test agree closely with the results of other tests at the same age. Particularly unreliable are the results of tests of infants under three months of age.‡ After three months of age, several of the more carefully constructed tests show consistent, although not high, correlations with each other and with later tests. We do not yet know how much of this unreliability of the infant tests is due to the fact that different tests stress different aspects of intelligence, or perhaps to the fact that certain aspects of intelligence do not begin to mature in the earliest months of life and hence do not show up in the various tests.§ Most of the tests used in earliest infancy contain many motor items which do not tap more than a segment of the development of intelligent behavior. In man, intelligent behavior appeared with the development of the cerebral cortex (higher brain centers), the development of the sense organs, upright posture and the use of language; so, in the infant, intelligent behavior develops in its most "human" form with the achievement of these maturities.|| Another way of saying this is to say that there appear to be two main factors which make up the mental organization of the child: the motor (nonmental) and the alertness or "mental" (nonmotor) factors. Whether the alertness

* Nelson and Richards²⁶³ have translated the Gesell Developmental Schedule results into mental age values.

† Shotwell and Gilliland have a scale for four weeks, eight weeks and twelve weeks. For a bibliography of Mental Tests and Rating Scales for children under six years of age, see Hildreth.¹⁶⁹

‡ Campbell and Weech.⁶⁶

§ Bayley.²⁸

|| Irwin.¹⁷⁹

(nonmotor) factor is present to any measurable degree before three months of age is questionable.* In proportion as the tests of early infancy are weighted with the motor factor, they will fail to correlate with later tests which are weighted increasingly with the alertness factors.

Tests of children from two to five years of age are somewhat more reliable than are those of younger infants, and appear to be increasingly reliable as they involve more alertness and fewer motor items.† Several intelligence tests have been widely used at this age level: the lower levels of the Stanford-Binet (1937 Revision), the Minnesota Preschool Scales, and the Merrill-Palmer Scale of Mental Tests being perhaps the most widely used in addition to the upper levels of the Gesell Developmental Scale. It seems clear that our present scales are not as satisfactory for research and service purposes as they should be and that further work in the evaluation of the intelligence growth of younger children needs to be done.

In spite of this unfavorable picture of standards and tests now in current use, many social agencies and physicians use these scales for helpful leads about infants. It must be assumed that no prediction is even approximately valid unless the examiner is well trained in the test technics and has had fairly extensive experience in the testing of young children. Young children require special handling and the results of their tests require special interpretation. Trained examiners should, and do, refuse to predict with any assurance the future mental development of children from a single examination. Reliability increases if two or more tests are used and checked against each other. It also increases if the child is tested again after an interval of several weeks or months. It is particularly helpful in adoption cases to have the child examined by a trained and experienced infant examiner, then given a trial period of several months in the new environment, followed by a re-examination, if possible by the same examiner.

Does Training Influence Intelligence?—This is a hotly disputed question.‡ Some writers have claimed stoutly that such experiences

* Richards and Nelson²⁹⁴; Black⁴²; Anderson¹²; Ebert and Simmons¹⁰⁶; Bayley.²⁸

† For an extensive review of these tests see Goodenough and Maurer.¹⁴⁰

‡ For summary see: 39th Yearbook, Nat'l Soc. for the Study of Educ.; "Intelligence: Its Nature and Nurture"; Pub. Sch. Pub. Co., Bloomington, Ill., 1940.

as attendance at nursery school raise children's test scores.* Other writers† deny that this is the case. The dispute seems to depend upon the interpretation given to test findings and to implications drawn from statistical handling of data. The relationship between health and test scores, between physical maturity level and test scores and other such factors seems equally clouded by argument over the validity of tests and of the statistical devices used to analyze the data. The general implication from the studies available seems to be that inner maturational factors outweigh environmental training in determining intelligence level as measured by the present intelligence tests. There is reason to believe, however, that seriously limited or sterile environments prevent any given potential intelligence from reaching its optimum in functioning. There is also evidence‡ that continued malnutrition and illness interfere with the mental alertness of children, if not with basic mental capacity. It is reasonable to suppose, too, that good teaching, if it does not actually raise the level of basic mental capacity, most certainly provides a wider knowledge and experience as materials to be used by whatever capacity is present.

It should also be recognized that intelligence as measured by standardized intelligence tests is not always the true picture of the actual working intelligence of the child. What is usually measured by the standard test are those verbal abstract factors of intelligence such as the factors of language ability, memory and other aspects of intellect which get along best in the formal schoolroom. Few standard intelligence tests measure the equally valuable aspects of intelligence which make some people intensely practical or which make others keenly adept at getting along with other people even though they may not possess the verbal abstract quality of intelligence.

Then, too, standard intelligence tests contain only those maturity indicators which can be set up in controlled test situations. They miss the numberless life responses which are the actual tests of intelligent or unintelligent adjustment to life. Again, the standard test results are all computed in terms of the age-scale concepts discussed in Chapter I. They have the basic fallacies of these concepts, since they do not make enough allowance for individual

* Skeela, Skodak, Wellman, Stoddard, of The Iowa Child Welfare Research Station, University of Iowa.

† Goodenough and Maurer¹⁴⁰; Bayley.²⁸

‡ Blanton.⁴³

variations of pattern and pace of growth. Free observation of children can reveal the individual patterns of the sequences of stages of development which are more important in individual guidance than the chronological age at which any of the particular stages may appear. Tests, however, are useful as general checks on accomplishment, and can give general guides on what to expect in overall intellectual achievement, especially of the kind that adapts well to school situations.

TOPICS FOR CLASS DISCUSSION

Sense Judgments

1. Fill in your developmental chart in this area.
2. If possible, observe the same child you observed before. Bring to class some evidence that sense perceptions and sense judgments are not innate, but, rather, are being learned by this child.
3. Compare this child's rate of growth in this area with his rate of growth in the gross motor area; in the fine motor area.
4. Observe the playthings and the experiences this child has which promote learning in the area of sense judgments. Have you any suggestions to make?

Language

1. Fill in your developmental chart in this area.
2. Observe your child in this area. Compare his language growth with the average standards of your chart; with his own development in motor controls and in sense judgments.
3. Get the history of his language development. Are his present status in language and his recent rate of development in the same channel of growth as his previous language development? If he has shifted his speed (or rate) of language development can you locate the reason for the shift? Do not neglect physical factors in considering these changes.
4. If possible, observe your child, or some other child, in a group of children. What happens to the amount of language he uses in a group as compared to the amount he uses when playing alone? When with adults? Bring these observations to class and compare them with the observations of children made by the other members of the class. How does the amount of language used by a child when alone, when with adults, or when with other children depend upon the stage of language development he happens to be in at the time of your observation? (If you have enough observations you will find that there is a relationship.) How is the amount of language used affected by such personality factors as shyness, negativism, social aggressiveness, etc.?

Memory, Imagination and Reasoning

1. Fill in your developmental chart in this area.
2. Observe your child in his use of memory, of imagination and of reasoning. Bring to class illustrations of his use of these mental faculties.
3. Compare his present rate of growth in these areas with his own past rate of growth in the same areas. Is he maintaining his channel, or has he changed

it at any point along the way? If so, can you locate the reason for change. Do not neglect physical factors in considering these changes.

4. Have some member of the class review Goodenough, F., and Maurer, K. M.: *The Mental Growth of Children from Two to Fourteen Years*. University of Minnesota Press, 1942. Discuss the values of mental tests as measures of young children's intellectual growth (both present status and continued rate).

5. Have some member of the class look through the past ten years of *Child Development Abstracts* (look in index numbers under "Intelligence" and under "Nursery Schools") for evidence on the possible effect of nursery school attendance upon mental test scores.

To what extent and in what way, if any, does an acceleration in mental test score mean an improvement in intelligence?

6. Does a drop in mental test score always mean a loss in intellectual capacity? Under what conditions might it mean simply that a child cannot use the capacity he has? Have some member or members of the class cover the past few years of *Child Development Abstracts* for evidence on this question. Use index numbers for leads on which individual *Abstracts* to read.

7. (a) What is your own earliest childhood memory? Was the emotional tone of it pleasant or unpleasant?

(b) Watch some young children for evidences of the length and type of their memory. Bring your findings to class, and compare your material with that brought by other members of the class. Do you find evidence among these children of adult coaching beyond natural inclination of the children?

8. Bring to class samples of children's original stories. Make a list of children's books appropriate for children one to two years old; children two to four years old; and four to six years old. Your own librarian can probably help you with this.

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*The Child Grows and Develops Socially and Emotionally*I: GENERAL PRINCIPLES

PERSONALITY GROWS AND DEVELOPS

Progress from Infantile Behavior to Maturity Should Occur in Every Phase of Social and Emotional Life.—Physical growth brings about conspicuous changes which can be detected by everyone. Physical growth as a phenomenon of human life is, therefore, recognized and accepted by everyone. Mental growth, somewhat less conspicuous in its manifestations, is, nevertheless, fairly evident. That personality grows, however, is not so evident to many people. The general belief of the public at large is that personality is just something that descends upon us and about which we can do nothing. Psychologists and educators have rather recently discovered not only that social and emotional growth are possible, but also that they follow certain clearly defined patterns of growth. They have found that this growth is, and for the best personality development should be, steady, well-rounded and constant. It begins soon after birth in the development of emotions. It may, if the individual so wishes, continue throughout life. Its 100 per cent maturity level may thus be later than in any other aspect of growth. This is true because this is the area of growth most subject to continuous development through changes in the attitudes and habits of the individual.

When the individual does not understand the principles of personality development, the so-called ceiling of development occurs early in life. Personality, however, may continue to change throughout life for those who do understand these principles. Some persons, in other words, become fixed or static early in life; others continue to grow, acquiring continuously better-balanced, more successful and more lovable personalities. The 100 per cent maturity level for such continuously developing personalities is

achieved only very late in life, after the individual has met the various vicissitudes of life as they occur, taking from each the richness and meaning which enable one to meet each successive stage of life fully. The ultimate level of development for such a personality is quiet acceptance of old age, in which joy and fulfillment are as real or more real than in earlier stages; it means ultimately an acceptance of death as the final fulfillment of life. For such a person there is no longing to go backward in life, no childish clinging to immature aspects of personality and experience. There is, rather, a looking forward and a fulfilled living at every stage of life.

Development of personality in the sense of change of personality traits and attitudes is, of course, most rapid in childhood, since the personality is in the most malleable or formative stage then. Habits, attitudes and feelings are in the making, particularly in the preschool years. Everything is new; first experiences are many, and important first emotional overtones are being laid in. Although these important "firsts" may be, and will be, added to and changed as time goes on, the fact remains that they *are* first and that, being there, they tend to color reactions to later experiences and hence to get a great deal of practice unless something happens to change them.

Much more can be done by parents and teachers to determine the course of personality growth than to alter physique or intellect, since attitudes and feelings are reflected from the attitudes and feelings of the adults who form the social and emotional environment of the child. Personality is, in important ways, the result of environment and experience. It is, however, also the result of the child's own inner reaction to his social and emotional experiences, since each child takes from his environment the things which fulfill his own inner needs, and each reacts to events and patterns in his environment in his own particular way. The child's experiences cannot be determined entirely by parents and teachers, but they can in many ways be outlined and steered into certain general channels. Just as the child's physical development can be directed by the richness or inadequacy of his food, by the fullness or the restrictions of his activities and other factors, so the child's personality development is affected by the stage set for him, the variety and quality of his experiences with people and with things and by the way the adults in his environment deal with him in the routines and experiences of his day. Loved and protected,

be can in turn love others; denied love and security he will either seek it frantically or withdraw into an inner world that cannot hurt him. Given varied and rich experiences shared with enthusiastic adults, he will learn to seek experiences and to be enthusiastic about learning. Forbidden activity, scolded and punished for adventuring into new learnings, he will either rebel or withdraw, becoming either overaggressive in his seeking of adventure or coming to dread and fear new experiences.

INNER FACTORS IN PERSONALITY DEVELOPMENT

Personality Types Differ.—What any given child will take out of his social and emotional environment will in a measure be determined by the basic or constitutional personality type he happens to be. Some children are phlegmatic, taking changes and adjustments to routines, accidents and other events in their stride. Others tend to be more excitable and to be more easily thrown off balance by changes and the need to adjust to new situations.

This shows in both physical and psychological reaction. The more phlegmatic children tend to be stabilized in total metabolic reaction; they sleep well, tend not to run a high temperature when ill and adapt to routines readily. On the whole these phlegmatic or "stable" children tend to be the children who follow the left-hand channels of the Wetzel Grid (see p. 3) in physical type. As a baby this type of child is the so-called "good baby." He does not cry easily, he takes the breast easily, has slight trouble learning to drink from a bottle or eat from a spoon and is not easily upset by changes in food or changes in light or temperature. He sleeps soundly through ordinary noises or distractions, is not particularly upset by physical pain and is not especially liable to disturbances of digestion. As he grows older he is steady going, adaptable and usually happy.

The more excitable or less steady child is a picture of the reverse qualities. He is likely to have trouble in learning to take the breast, is inclined to be easily upset by change of any kind, cries easily, fatigues easily, runs a temperature with slight cause and is susceptible to digestive disturbances. As he grows older he gives evidence of overexcitability and hyperactivity which often lead to excessive fatigue. This fatigue is of the type that deceives parents, since an overexcitable child when tired does not as a rule become sleepy, but is likely to run faster, shout more loudly, and appear unusually alert. When finally put to bed he will, if

overtired, take a long time to go to sleep and will, after the first exhaustion is slept away, spring into action again, driven by an overexcited nervous system to demand entertainment or attention at four or five o'clock in the morning. It is usually hard to convince parents that these symptoms point to the need of more rather than less rest. The unsteady child is likely to be changeable in mood, and is particularly likely to over-react to any nervous strain or emotional tension in the family atmosphere. On the whole these excitable children tend to be the children who follow the right-hand channels on the Wetzel Grid. They are often considered "more interesting" personalities than the steadier children.

The above description does not necessarily imply that the steady child has a more desirable personality than the unsteady child. Stability may sometimes amount to flaccid indifference and to stolid lack of imagination, whereas the child who reacts keenly to sensory stimuli, who sees and hears things that others fail to, and who has an alert and fertile imagination, may be far more interesting as a personality and may eventually make a far greater contribution to the art and thinking of the world than the so-called steady child.

An unfortunate aspect of the excitable child's history is that he is usually born of excitable parents. Not only must he bear his heredity, he must, if he lives with his parents, spend his most impressionable years in the excitable environment which excitable parents inevitably produce. Thus he has no ally in his environment to help him overcome the handicap of his heredity. We can indeed feel the tragedy of the child who, needing more than most children a quiet stability of environment, must be surrounded by the persons whose heredity forced the need upon him, but whose very nature makes them least fitted to fulfill that need. Tragic as it may seem, it is the unsteady parent who is most likely to burden a household with the bugaboo of the word "nervous," who himself flies to pieces in the very crises with his child that demand quiet self-control. He, the parent of an overexcitable child, is most likely to produce an atmosphere of overexcitement. The excitable child, most in need of regularity in routine, most easily disturbed by irregularity of feeding, of sleep hours and of elimination, is usually the child whose parents are most likely to offend by interruptions in routine. The steady child, who could best survive extra movies, delayed meals and haphazard hours for toilet

attention, is seldom the one who has to adjust to such difficulties. His parents do not crave the stimulation of constant parties and extra guests in the home, worry too much or keep themselves in an overfatigued state of hypochondria.

Charles and Sally illustrate this point. Charles, a tense, high-strung boy of three, is constantly on the move. He runs about, seldom slowing his movements down to a walk, is likely to shriek with excitement every few moments in his play, cries easily when hurt and finds it almost impossible to relax at nap time. He is never ready to go to bed at night, often lying awake until ten or eleven o'clock even though put to bed early. In spite of this he is usually to be found jumping about in his bed or running about his room ready for action at five o'clock in the morning. His family seem unable to help him achieve rest. Both his father and mother are quick-moving, high-strung people whose voices are inclined to shrillness and whose presence adds tension and excitement rather than relaxation and quietness to the family atmosphere. The mother has tried rubbing Charles' back at night in order to help him to relax, but her own tenseness serves only to key him to a still higher pitch. The remedy for Charles' excitability is not to be found in rigorous insistence that he sit quietly for certain periods of the day or that he spend more hours in bed, much as this would help. The real solution lies in a change of family atmosphere—a reorganization of family routine to minimize hurry and to build up more of a feeling of leisure, a definite rest period for the mother in order to decrease her fatigue and feeling of tension and fewer family excursions of an exciting nature.

Sally, on the other hand, is a child who plays hard but who stops to sit quietly when she becomes tired. She alternates quiet periods of handiwork or of looking at books with periods of vigorous play. Her voice has the quiet pitch of a rested child and is seldom shrill or whiney as is the voice of an over-excited or overfatigued child. She is hungry at meal time, eating her meal with dispatch, and trots off quietly to nap or to bed where she drops to sleep within five or ten minutes. She awakens refreshed and smiling. Sally's parents are quiet-voiced, well-poised people who have a great deal of pleasure but who seldom allow themselves to become overfatigued to the point of irritability and tension. They go out frequently and have guests in their home, but always manage so well that Sally has a fairly quiet supper and gets to bed before the guests arrive. The mother plans the day's routine so that breakfast can be an unhurried meal, that dressing, toilet and other essentials are allowed for in time, thus minimizing the feeling of tension and hurry which plays so large a part in Charles' life.

It must be remembered, however that these two children represent extremes of personality type. Most children lie somewhere between these extremes in their reaction to the usual stimulations of life.

The phlegmatic child, reacting to changes of routine as he does, can be subjected to more irregularity than can the excitable child. The excitable child, once he has settled upon a reasonable regularity (see Chapter VI on self-demand schedules), should be given

a fairly regular and undisturbed life if possible. No child, however, should be over-routinized or over-protected, since all children in modern life are eventually called upon to adapt to the vicissitudes of living and to the convenience of others, especially when they marry. They must not be allowed to become habit bound or inflexible as personalities. A fairly safe rule for any child, phlegmatic or excitable, is to let him settle into his own routine and to see that this routine remains adaptable to his growth needs as he changes and develops. All children prosper in growth better if they have a fairly regular life, yet one which is not devoid of interest. Protection from exposure to nervous strain, emotional tension or overstimulation of any kind is a pretty safe rule for children. Yet their lives must be interesting and intellectually stimulating, offering enough demands for adaptation and adjustment to encourage the ability to meet difficulties when they arise.

Introvert or Extrovert—Another Way of Viewing Personality.—Another way of classifying personality besides phlegmatic and excitable is to class persons as tending either to introversion or extroversion. These words mean to *turn in* or to *turn out*, and when applied to people mean that some people have a tendency to turn their attention and interests toward a center inside themselves, and some toward a center outside themselves. Individuals whose predominating attitudes and feelings turn in and who for this reason would be called introverts are more interested in ideas than in people or things, and are more inclined to “sit and think” than to “go and do.” They are likely to be the students and philosophers of the world. Persons whose attitudes and feelings turn outward and who for this reason are referred to as extroverts are more interested in people and things than in ideas. One usually finds them among the business people, the mechanics, the political, social and business leaders. Most people belong neither to one marked type nor to the other, but have some traits of both types as we shall see later. In so far as the child leans toward one type or the other, however, he is likely to react to specific situations in one way rather than in another. To seize upon the following discussion as a basis for diagnosing personality types would be to presume too greatly upon the scientific knowledge now available about personality. The only aim of such a discussion is to correct the false idea that specific situations in family life will inevitably give rise to specific and predictable behavior reactions in all children. Not all children react to given situations in the same

way, but they will differ at least somewhat in accordance with the tendency toward one personality type or the other.

Reactions of the Introvert and the Extrovert Child.—When an introvert has met with unhappiness he is likely to retreat into thoughts and day dreams; the extrovert is likely to try to “work it off” in action, or to seek solace from people. If a child has, for lack of normal companionship, developed imaginary companions, the introvert child will find such companions very real and so satisfying that he is inclined to cling to them even when flesh and blood children are provided for him to play with. The extrovert child, however, finds imaginary companions a pale substitute for live children, and when exposed to children abandons his shadows promptly in favor of real substance.

If a parent nags his child too much, the introvert child is likely to give submission in action but to withdraw to his world of dreams for interest and satisfaction in life; whereas the extrovert child is likely to fight his parents, to become “negative” and resistant, because he can find interest and satisfaction only in the real world, a world in which he finds himself so constantly intruded upon that he must resist. One should not punish an introvert child by making him “sit and think”; he has too much tendency to do this already and may get from his punishment only a habit of magnifying grievances and “building mountains out of molehills.” On the other hand, a short period of “sitting and thinking” may be just what the extrovert child needs to make him take time from his numerous active interests for a quiet analysis of his own motives.

The introvert child, being quiet and withdrawn, usually slips past his parents and teachers without attracting much attention or causing much anxiety. He is not troublesome, and hence is seldom reported to clinics for help unless it appears to the adults in charge that he is uncooperative. He usually meets his problems alone and unaided, burying his difficulties within himself or retreating from them to his day dreams. The extrovert child, on the other hand, meets his troubles in the open. Symptoms of conflict or of unsolved problems are immediately evident. If he finds life unchallenging or unsuccessful, he promptly feeds his natural curiosity by probing and investigating—often in forbidden places—or seeks success in mischief. He throws pin darts in school or incites rebellion against the teacher to keep from being bored. He may steal or lie to create excitement. In any case, he finds

something to do which, though often producing trouble, at least provides a growing mind with something substantial to feed upon, or permits a real outlet for emotion. The introvert child, unchallenged or unsuccessful, retreats quietly. He is no trouble, so we miss the fact that he may be feeding his mind on shadows, or collecting steam from unsatisfied longings which occasionally bursts forth in explosions or resentments. The psychologist is likely to worry about the future of the child who is docile and withdrawn—the child about whom parents and teachers often congratulate themselves most, and is likely to feel comfortable about the future of the child who “is the despair” of his parents and teachers.

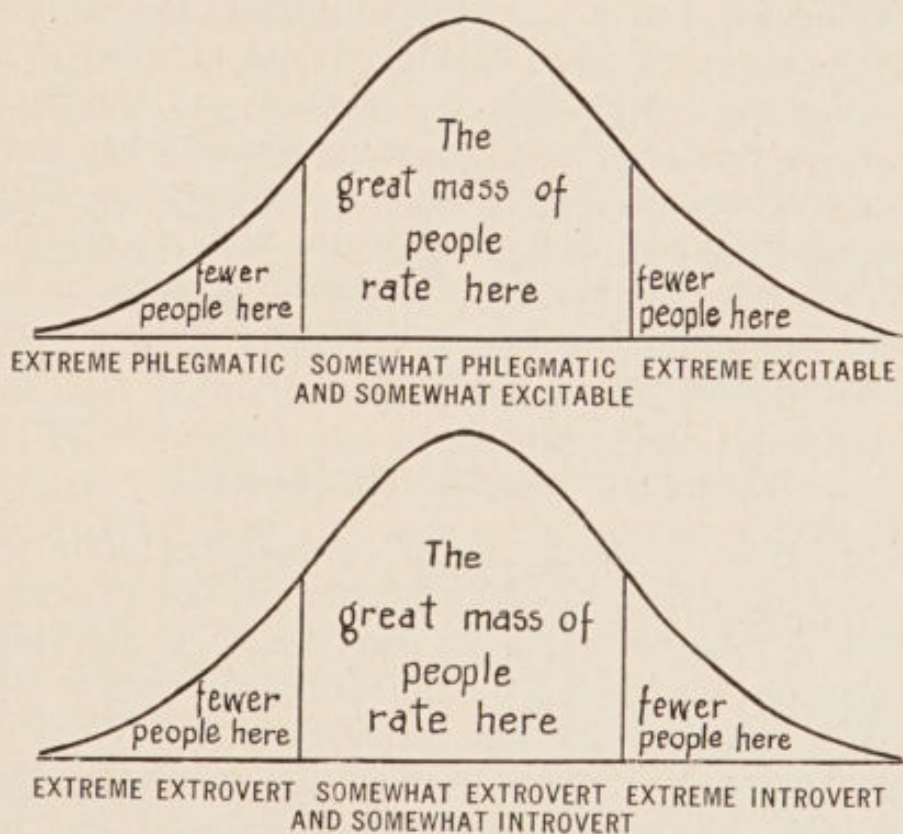


Fig. 55.

Types Are Not Clearly Defined in Most Children.—We must bear in mind that there is no clear-cut demarcation between phlegmatic and excitable, or between introvert and extrovert. The great mass of people are somewhat phlegmatic and somewhat excitable, somewhat introvert and somewhat extrovert. The familiar bell-shaped curve illustrates the probable distribution.

Neither extreme of phlegmatic or of excitability, of introversion or of extroversion, is to be cultivated as an ideal, but each should be achieved to the extent that phlegmatism is seasoned with

adaptability, and excitability with a basis of sound habits; introversion and extroversion should temper each other. Wickes states the case thus: "Introversion must be guided so that it may not become morbid introspection, which shuts the person away from the world of human activity and human relationships, but rather a process making for the understanding of these and leading at last to a realization of the good within. Extroversion must be controlled so that men may not become lost in the multiplicity of things, but may be able to meet squarely the responsibilities of adaptation to the world. Neither of these two forms of psychic activity may be emphasized at the expense of the other if man is to develop as a whole. Any attempt to stimulate the growth of one side while suppressing the other must result in frustration."*

We should remember when dealing with children to watch for tendencies toward one extreme or another, and should accept such tendencies as important in producing behavior and determining reaction to guidance. We should take them into consideration when we make demands upon children and when we evaluate and treat their behavior, molding our program to produce best results not only for immediate solution of problems, but also for the future personality growth of the child.

CONSTITUTION OF THE FAMILY

The child's place in the family has some effect upon the way his or her personality will develop. Whether or not he or she is an oldest child, a youngest child, an only child, an only boy in a family of girls or only girl in a family of boys all tends to influence the experiences the child has and hence the attitudes and feelings developed as personality grows. It matters, too, whether the child is prettier than the brothers and sisters or uglier and whether smarter or duller, since these facts, too, influence what the child hears about himself or herself; what is conceded to or demanded of the child, what, in other words, the personality developmental experiences are.

The Oldest Child.—The oldest child has had at least a year or so in the family as the only child, after which he is forced to yield part of the attention and affection of his parents to a younger child. If he has been prepared to share his place willingly with the new baby and if he finds himself shifted to a position of older

* Wickes⁴⁰³ (p. 12 f.).

brother and in this role is given a new type of attention and affection, he will probably take the change in his fortunes gladly. But if he finds only that the arrival of a new baby means complete displacement for him, the change will cost him much in emotional strain.

The oldest child suffers another handicap. Having been the first child, he has had to serve as practice material for his parents, and has had to suffer from whatever mistakes they made through ignorance. There is hope that oldest children can be spared this handicap as the movement for preparental education grows, since through preparental education a knowledge of the principles of parenthood can be provided before the arrival of the emotional strains and responsibilities of children. In some families the oldest child remains the favorite and is spoiled accordingly. In other families he becomes a substitute parent for younger children and has to shoulder too great a burden of responsibility too soon. He may, for example, be the one who cannot have the advantages of higher education, yet is sacrificed to produce those advantages for younger brothers and sisters.

Studies differ in analyzing what the effect of these experiences is most likely to be, but several studies show that oldest children tend to be somewhat more delinquent than other children (the assumption being that parents learn the job of parenthood on their first child), and that oldest children tend to be somewhat more jealous. These tendencies can be overcome if the first rival baby is properly introduced to the first child, and if steady, kindly discipline discussed later is given.

The Youngest Child.—The youngest child in the family is likely to suffer because he has no occasion for giving place to a successor and thus remains the baby of the family too long. He may be deprived of the privilege of carrying a normal burden of responsibility, and may grow up a spoiled, dependent type of personality because he had no practice in sacrificing himself for the welfare of the family group. Occasionally the youngest child suffers for another reason. With all the older members of the family not only to wait on him but to “boss” him, he may become irritable and defiant, or quiet and sullen, because he is subject to too constant and too inconsistent commands. It is particularly important that the youngest child be given the same opportunity for growth toward independence and self-responsibility that other members of the family have.

The Middle Child.—The middle child or children may suffer because, being neither oldest nor youngest, they are allowed to slip into the background of parental attention and affection. They are likely to inherit the clothes of the oldest, and to spend their lives trying to imitate the behavior or win the approval of the older brothers and sisters, thus failing to live their own lives or to develop their own personalities sufficiently.

The Only Child.—Studies differ radically in their findings about only children.* There is a popular belief that only children will inevitably turn out badly because they are always spoiled. Fact reveals, however, that they often turn out extremely well because they have health and educational advantages which parents of larger families cannot always afford for all their children. There is some danger of spoiling, of course, when two parents have only one child upon whom to lavish all of their attention and affection. They are likely to find it too difficult to deny any of his whims or to discipline him for undesirable behavior. There is double danger for the only child, since if parents fail in discipline in large families, the brothers and sisters are fairly sure to see that selfishness and other bad behavior are curbed. If, however, the parents of an only child fail him in this respect, he has no brothers or sisters to help him. Parents of only children should be especially careful to see that these children receive adequate discipline, and that they have adequate opportunity to learn the natural lessons of independence, unselfishness, and the give and take of life. These lessons can best be learned in free contact with other children; so for this reason, as well as to insure normal social development, only children should from an early age be encouraged to make contacts outside the immediate family and to select their own companions with some degree of freedom.

The Only Boy or Girl.—The only boy in a family of girls and the only girl in a family of boys are usually in some degree selected for special treatment by the other members of their families. The danger here is not only that such a child may receive an undue share of attention and affection, but that he or she may get the idea that there is something particularly sacred about the sex to which he or she belongs. Any situation in a family which permits undue privileges to one sex, either to boys or to girls, at the expense of the other sex is harmful to the growth of the children of both sexes. Each sex should be taught a fundamental consideration

* A review of these findings can be found in Breckenridge and Vincent.⁵²

for the viewpoint and the happiness of the other. Whether a boy or a girl, each child should learn that there are far greater differences of personality within either sex than between the sexes; that kindness, generosity, sweetness, courage and strength on the one hand, or brutality, selfishness, ugliness, cowardice and weakness on the other are traits to be found within both sexes, and that none of them is to be assigned sweepingly to either sex as a sex characteristic. One owes loyalty or dislike, not to one's own sex or to the opposite sex, but to certain persons who display given characteristics regardless of sex.

Families made up of boys only or of girls only should see that cousins or neighboring children of the opposite sex are introduced often enough and for long enough periods that close acquaintance follows. Acquaintance with members of the opposite sex in the routine of school and of daily living is advisable not only to give acquaintance with personality traits of the opposite sex during school years, but also to develop a natural social ease between the sexes. Familiarity with younger brothers or sisters or with younger children of the opposite sex may serve also to give in early childhood the knowledge of differences in anatomy of the sexes which child training specialists feel should be achieved before children are of school age. Acquaintance with the anatomy of the opposite sex comes naturally and easily if boys and girls share the daily routine of living in infancy and up to four or five years of age. Practically all authorities in sex education agree that natural and early acquaintance with the essential differences in sex anatomy is desirable because it satisfies a very natural curiosity at an age when emotional factors have not risen to attach undue significance to the information.

Differences in Ability and Appearance.—We should recognize, too, that differences in ability and appearance may, and usually do, conspire to produce differences in the amount of attention and affection given to children. A single normal child in a family of superior children, a single dull child in a family of normal children or a single unattractive child in an attractive family is almost sure to suffer because of the constant unfavorable contrast. If such contrast becomes obvious to the child, the resulting sense of inferiority may prove disastrous to his personality growth, and may keep him from developing to the maximum whatever ability or appearance he may have. Attempts to avoid inferiority feelings should not, however, be allowed to develop

into situations in which weaknesses of body or mind are allowed to serve as excuses for wholesome effort toward achievement on the part of each child in the family. Even though a child may be handicapped by a crippled body we should insist that he make a real effort to carry his share of family responsibility. Otherwise he may learn to cherish his weakness as a means of attracting attention or as a ready excuse for laziness, and may thus grow up not only with a crippled body but with the handicap of an undesirable personality as well.

On the other hand, a single superior child in a family of normal children, a single normal child in a family of dull children or a single attractive child in an unattractive family may receive altogether too much attention, and may develop an unwarranted sense of superiority, thus growing into conceit, intolerance and laziness.

How to Meet These Differences.—The best way to meet these differences is to see that each child in the family is awarded praise or blame according to his effort as well as according to his product. Each child should come to recognize his capacities as well as his shortcomings, and should develop a sense of responsibility for contributing, first to the family, and later to society, the best that he has to give. Each should learn the value of humility for his faults and shortcomings, and should grow up with a determination to overcome his failings if reasonably possible. No child should take upon himself the credit for inheritance of a superior brain or an attractive body; yet, he should appreciate his gifts and should feel responsible for their proper care and development. Attractive or unattractive, brilliant or dull, every child should learn the value of good work habits, of unselfish consideration for others and of tolerance.

Regardless of sex, age, ability or appearance there should be no obvious favorites in any family. This does not mean, of course, that all members of a family can or do love all other members with equal intensity or with equal understanding or rapport. It does mean, however, that each member of the family should at all times and under all circumstances show reasonable respect and consideration for all the other members of that family. Only in so far as we achieve this can we hope to achieve eventual harmony and progress in society at large, since social habits learned within the family largely determine general social viewpoints.

GOALS FOR PERSONALITY GROWTH AND DEVELOPMENT

General Goals.—In our society as it is now organized we know that children, when they become adults, will have to meet certain specific tests of their personality adjustment. They will, for example, have to *maintain themselves economically*, either earning a living in the competitive economic world, or conducting a home efficiently within the family budget. This will require certain skills which are either salable in the economic world or which will permit the efficient, economical, yet satisfying conduct of a home. This economic independence will also require certain abilities to adjust to people. If the living has to be earned in the economically competitive world, an ability to get along with any type of person one happens to be thrown with is necessary. If the living is earned as an effective housewife, it requires getting along with the butcher and other salespeople, with the neighbors and particularly with husband, in-laws and children. Thus, earning a living requires not only certain specific motor and intellectual maturities and skills, but also certain social capabilities.

Earning a living is, of course, only a means to the end of good living. Beyond producing an economic independence, the adult should be so well grown socially and emotionally that he can be happy in the living he earns. He should be *able to win and hold friends, and to be a good participating member of some community group*. The vast majority of adults marry and establish families. The child must, therefore, as he grows, prepare to get along with people both on the wider plane of friendship and citizenship and on the more intimate plane of close family living. In the latter plane he must somewhere develop the attitudes, feelings, controls and skills which will permit him to select a mate wisely, to win and to hold this mate throughout adult life. Or he must learn to live with his sex and parental drives without marriage if he does not find a satisfactory mate.

In order to select either friends or mate wisely the adult must develop somewhere in his personality growth and experience sufficient knowledge of people to know good traits of personality when he meets them. Otherwise he will be likely to choose bad or unreliable friends and to find himself tied for life to an undesirable mate. But he must have more than an ability to judge good as opposed to undesirable people; he must have also sufficient self-discipline and enough workable consideration of other people to make him a good friend and a good mate.

Not only must the adult earn a living and live happily with other people. He *must* also *live happily with himself*. He must accept himself with all of the assets and liabilities which he, along with everyone else, has. He must discover and trust his talents and capacities, somehow fitting his own peculiar special skills and talents to the life demands around him. He must also accept whatever liabilities or handicaps there are in his own particular makeup. From the earliest adventures into living the infant should learn joy in using whatever ability he has, and should at the same time learn to accept the fact that he is not all-perfect or all-powerful. He should find pleasure in the exercise of his capacities, yet should accept the fact that there are some things in which he cannot "be the best in the whole world." High standards which require genuine hard work to accomplish should be instilled; yet these standards should not be so high that the child develops a constant sense of failure and inadequacy. One of the greatest skills demanded of parents is the ability to gauge demands upon the child to fit the child's maturity readiness (see Chapter I), and yet to set the stage in such a fashion that the child learns early the supreme inner joy of success achieved through genuine effort. Adjustment of parental ambition for the child to the child's abilities will be discussed more fully later, since it is one of the important aspects of the parent's relationship to his child.

Personal philosophy is learned in many important ways early in life. The best adjusted adults seem to have some inner source of spiritual strength which draws upon a genuine confidence that life is an orderly process, governed by laws more omniscient and more wise than man himself is capable of creating. Well-balanced adults are capable of a longer range view than that of the moment, and are thus able to keep a sound sense of proportion about the details of daily living. They are able to tap continuous sources of inspiration and thus to keep a continued zest for living. They have an inner guide or conscience which directs both the detail and the general plan of their lives. An effective conscience keeps one from making impulsive social and personal mistakes; it leads one to do the socially and personally constructive acts which are the true source of deep, unshakable happiness. How some of these traits and attitudes develop in young children will be discussed a little later. That they have their roots in early childhood and make important beginnings in the preschool years is the point for consideration here.

More Specific Goals.—The goals discussed above are the more general goals for social and emotional development. There are, common to the achievement of all of these, some more concrete, specific objectives which can guide parent or teacher in the handling of young children.

Physical health, though not absolutely essential to full personal living, is a great asset. Healthy babies are happy babies and active ones. The general mood of living can be either gay, joyous, active and busy, or it can be depressed, lethargic, dull and fruitless. Healthy, happy, active babies tend to develop a *mood habit* toward joyous living. Sick or neglected babies tend to develop a mood habit of fretfulness or listlessness. Active babies practice motor skills and thus tend to develop good control over their bodies. This body control is productive of increasing self-confidence, since the body is the most ever-present instrument upon which the child practices control by his will and through which he learns the gratification of skill which is the expression of will. Body control also provides the skills which make one welcome in group play in the later preschool and school years. Thus it proves a means of expanding social experiences with the resultant development of social skills. Control over hands, and the physical zest which health lends to creative work with the hands, provides for many children the developing interests and skills which widen intellectual horizons and open avenues for sublimation of pent up emotional energies. *Creative interests and skills* can provide a stabilizer for emotions all through life. The tragedy of many people's lives is that they have never developed such skills or discovered the fact that constructive emotional outlets ease tensions and fulfill emotional longings. To have developed these skills and to have made this discovery in early life is a great help in later living.

In addition to control over the body, children can learn early in life the joy of *widening intellectual horizons*. Discovery of the properties of objects in one's daily environment (see development of Sense Perceptions and Judgments) is a continuous voyage of adventure to the young child. If he is permitted to widen his knowledge and to develop his skill in handling objects, he becomes an intelligent person in the sense that he learns skillful use of the objects in his daily environment. The persistent question-asking of the preschool child can prove a means of giving him not only a rapidly increasing intelligence about the world around him,

but more important, can set in him the habit of continuously expanding his knowledge. Constructive intellectual curiosity is not only the source of all human invention and knowledge, it can also prove the chief means of developing well-informed individual minds. A constantly expanding intellectual horizon serves not only to teach children how to live efficiently and interestingly, it can also serve to expand the period of youthful interests and zest into the advanced years of life.

Through learning the fun of practicing a motor skill until it becomes smooth and perfect, through developing the zest for expanding intellectual horizons and through discovery of the pride which comes from taking an increasing responsibility in productive work, children can learn one of the most important attributes of living, namely, the *ability to mobilize productive physical or psychological energy* toward the accomplishment of some useful objective. One of the most frequent complaints that has been made both by school people and by employers about modern young people is that they can work only when they are particularly interested or are "in the mood." Too few modern young people, particularly in cities where the work of children in families is not needed or utilized, ever learn how to work at something for the simple reason that the job must be done whether one happens to feel like doing it or not. Too many young people in high school or college, for example, can pass an academic subject only when they can see an immediate use for it; too few can take a prerequisite subject like Latin and master it for use a few years later in some science like medicine. Pride in work well done begins in the preschool years in such simple tasks as helping mother wipe the silver, and in wiping it until it is really dry so that the task deserves a "well done" from mother.

Part of the successful mobilizing of energy, and an absolute prerequisite to living happily with other people, is the development of the *ability to curb one's own impulsive whims and selfish wishes as well as the development of consideration for other people's wishes and needs*. Such development begins, or should begin, at twelve to eighteen months of age in the first acquaintances with people, not only in the home but also outside the home. It grows also in the first habits of self-maintenance like feeding oneself and caring for one's own toys. It should continue through the expansion of the social self in love of playmates, the loyalties to the gang, the friendship and hero-worship of early adolescence and the de-

votions of later adolescence. The development should also progress in expansions of the spiritual self, and will do so as independence, self-control and tolerance are learned through contacts with ideas and interests outside of the home as well as in the home.

This does not mean that anyone should drive his own personality underground so that he becomes the shadow of other people's needs and desires; nor does it mean unreasonable suppression of one's own instinctive impulses to the point of neuroticism. It does, however, mean an increasing control over anger, fear, jealousy, appetites of all kinds and other emotions which, undisciplined or uncontrolled, can lead one into serious difficulty. It also means an increasing awareness of the fact that other people have needs and rights which, for even reasonably happy living, must not only be recognized but adjusted to. Infants, for example, must have a routine adapted to their own needs, as has been pointed out (see Ch.VI), but in the preschool years children should increasingly adapt their needs to the routine of the family in which they live. Most children of two years learn to take their meals with the family, requiring occasional mid-meal snacks, but basically adapting their physical hunger to the routines of the family. Thus they learn both increasing control over their appetite, and at the same time the greater efficiency and fun of living in the family group in which each person adjusts to the others in a family routine.

Another important attitude which determines much efficiency and happiness is the *attitude toward property and other material possessions*. Some adults worship material possessions, working themselves into physical breakdowns in order to accumulate them, or hoarding possessions already obtained in a miserly fear that there may not be enough for protection in the future. Other adults are extremely careless of possessions, leaving farm machinery out to rust, ripping the tires and machinery of automobiles with slapdash starts and stops and spending money lavishly in continuous night-club binges. Reasonable regard for material possessions, balanced by the philosophy of enriching present living as against future possibilities, seems the desirable attitude toward material possessions. This, like all other attitudes, is given to children by the pattern their parents set for them and by their own experiences in the possession of property. These, like other lessons, must be learned gradually; but they have their beginnings in the early preschool years, when the toddler learns to respect Daddy's book

though he may turn the leaves of his own linen (and hence not easily torn) book, or when the three-year-old learns to wheel his tricycle into the garage so that it will not be rained on during the night.

Cooperation with law and order is another trait which needs to be developed in children. This is an aspect of the development of self-control, and requires an adjustment to Right for the sake of Right, or to law or authority because all people must live under law. It means throughout childhood the development of an ability to cooperate with whatever just and reasonable authority one may have to live under. At first, of course, this means acceptance of the authority of parents, and the ability to accept orderly routine. Later it means the adjustment to school teacher and principal, to Sunday School teacher or the neighbor child's parent while playing in the neighbor's yard. It also means cooperation with the rules of school or scout group or other community group, as well as obedience to the rules of group games and school or community activities. How to develop a desirable attitude toward authority in children will be discussed a little later.

There are many other habits and attitudes which are important to well-balanced and happy adult living. The ones discussed will, perhaps, suffice to demonstrate what some of the specific goals are which can guide parents and teachers in their thinking about children. The important point to be borne in mind is that personality is made up of habits, attitudes and feelings which are formed throughout life but which have their most important development in childhood. Some writers believe that the most important aspects of personality are set in the preschool years. Whether or not this is true, few writers fail to point out that the preschool years are years in which basic feeling tones and mood habits are developed.

INNER EMOTIONAL DRIVES

Physical Needs.—Personality is the by-product of the interplay between the child's constitutional personality type, his inner instinctive drives or emotional needs and his experiences. All people have certain inner emotional needs which motivate behavior and color the form of reaction to environmental experience. Certain basic longings must be fulfilled if life is to be satisfying. Some of these, like the *hunger for food* and the *need of rest after activity* must be fulfilled if physical existence is to be maintained. These have been discussed in Chapter VI.

Physical and Psychological Activity.—The need for physical and psychological activity is almost as demanding in children as is the need for food and rest. The waking time of even the tiny infant, if he is not physically ill or psychologically handicapped, is occupied with almost continuous activity. Arms and legs wriggle and jerk about in uncoordinated but continuous movement which gradually comes under the control of the will and assumes the coordinations of skilled movement (see Motor Development). Vocalizations are also almost constant as the child begins his gradual mastery of the spoken language (see Language Development). By the time the child is "run-about" age he is constantly on the move, running, climbing, poking and prying into everything in the house. His mind is also constantly on the alert, so that his general bodily and manual activity is feeding into his intellect increasing knowledge of the properties of the objects around him. The continuous activity of the child who has just learned to run about is a great trial to his family unless a safe and interesting place has been provided for him where he can be active without being destructive. Throughout early childhood this drive for physical and intellectual activity increases. It provides one of the chief means of improving motor skills and of feeding the growing mind. It cannot be denied without genuine damage to the child. To curb it beyond reasonable demands for self-control would repress this inner drive and would result in either withdrawal for the introvert type of child, or rebellion for the extrovert.

Every family, then, should make provision for both indoor and outdoor space for free bodily activity from the time the child is a year old, and most certainly by the time he is two years old. This space should be safe, so that he can move freely without the constant supervision of an adult. Ideally in the house for the year-old to the two-and-one-half-year-old, it should be a room with a gate across the doorway. He should, however, not be expected to remain socially isolated from the family for more than a few minutes at a time unless he is obviously busy and happy. Outside it should be at first an ample play pen, then a fenced-in yard. As the child develops control over hands and body and learns enough judgment about the handling of precious objects about the house, he should be given the range of the house. At no time, however, should he be allowed to be destructive. Given an increasing play space with adequate climbing and running, lifting and pulling opportunities out of doors, there is no reason why a

three-year-old child should be allowed to jump up and down on the living-room davenport—either in his own home or in other people's homes. Intellectual activity should be provided for by a variety of planned as well as spontaneously initiated opportunities.

Social Contacts.—Just as the child needs space and reasonable equipment for bodily activity both indoors and out, and just as he needs ample opportunity to exercise his increasing skill and to expand his knowledge in the use of his hands and his mind, so also does he need the company of other children. Infants, as we shall see later, do not require the presence of other infants, but by the time most children are two to three years old, they need the fairly frequent presence of other children, preferably children somewhere near their own developmental age. The longing for companionship is so genuine that the imaginative child will invent imaginary companions if real ones are lacking (see *Development of Imagination*). Many of the most valuable lessons of life can be and are learned from adults, particularly from parents. There are however, other lessons of social and personal adjustment which can be learned only from other children. Much of the physical activity demanded by growing children can be supplied best by other children, as can much of the give and take socially which teaches natural social lessons as adults cannot teach them. There is, beyond this, a simple urge for sociable exchange which seems to be a basic emotional drive in children.

Love of Parents.—One most important need of children seems to supersede all others if personality development is to be optimal. It is so important that a child could have all the above needs provided for and still be badly stunted or warped in personality development if he does not have the warm love of his parents. Even though children are meticulously cared for physically and have their needs for activity and for other children conscientiously met, if they lack close warmth and love which most parents instinctively give to their children, personality development will suffer. Parental love fills so great a need in children's lives that many children, lacking what appears to be even the essentials of physical food, thrive because they have the warm love of both parents.

It has been demonstrated in experimental studies that even such mothering as can be given by a hospital nurse who takes time to hold a baby and talk to and pat it while feeding it, can reduce infant mortality in a foundling home. Dr. Josephine Baker in

speaking of the mortality rate among infants in foundling hospitals says: "High mortality rates are common to institutions of this type. They are in no sense an indictment of the way in which the institutions are managed. There are few foundling hospitals at the present time that are not conducted as well as any modern baby hospital. Practically all of these institutions have competent medical boards, use the most improved and modern methods of hygiene, and give the children under their care the best possible health supervision that can be afforded by any institution. The difficulty seems to be not in neglect, but in the mere fact of 'institutionalism.' There can be no question whatever that babies cannot be raised wholesale. The most important factor in the welfare of a baby is his mother. Moreover, babies cannot be kept alive by routine care, no matter how efficient or systematic it may be. Babies who are merely nursed, bathed, and turned at regular intervals are quick to lose their vitality. Every baby needs mothering."* It is a fact well known to nurses in children's hospitals that after the critical stage of an illness has been passed, if the convalescence is long, children and infants gain strength faster at home where they can feel the love of their parents than they do in hospital wards where they are deprived of that love. Psychoanalysts† have clearly shown that for fullest and most adequate personality development in our culture children need the love and close contact of their parents. In the earliest months of life the love and close physical contact of the mother fills certain deep inner needs of the child, who, in birth, has suffered separation from complete contact with his mother's body. As the self develops (see p. 424 ff.), the father plays an important role in the psychic development of the child, setting for him not only patterns for adult male conduct, but making possible the emotional acceptance of men as persons.

Discipline.—Since the world cannot be made up entirely of people who love us as parents do, and since there are certain real situations like grief, hard work, the convenience of other people, and so on, which cannot be evaded but which must be faced, the child needs more from his parents than security in love. He also needs a steady discipline which will help him to adjust his own inner needs and wishes to the needs and wishes of other people and to the facts and situations of the real, work-a-day world. Some

* Baker²¹ (p. 248f.). By permission of Harper & Brothers.

† Horney¹⁷³; Freud¹²²; Ribble.²⁹²

parents seem to think that if one loves a child, one cannot or must not discipline him; or, vice versa, if one disciplines a child, one cannot love him. This is a false assumption, since the good parent loves his child through any and all vicissitudes, yet administers quiet and reasonable discipline whenever it is needed. It is not a question of love *or* discipline; it is, rather, a question of love *and* discipline. The method of discipline should fit the child's stage of maturity, his personality type or temperament, his particular offense and the situation of the moment.* The parent who truly loves his child and observes him enough to see the effect of various types of discipline administered can scarcely go wrong in the form of discipline used unless he is himself an immature and uncontrolled person.

One of the most frequently discussed topics of parent meetings is the topic of discipline. "How can I make my child mind me?" "When should I insist upon his minding me?" Some parents, of course, do not stop to think about the matter at all, but live with their children from moment to moment exacting obedience or excusing disobedience by whim rather than by principle. If a discussion on the subject arises, however, there usually develops two extreme viewpoints and all grades of variation in between. On the one hand, some parents will say that they expect instant and unquestioning obedience from their children, and will give as their defense a statement that obedience is a difficult but necessary life lesson which must be learned early and thoroughly. On the other hand, some parents will say that the most important thing for children to learn is to make intelligent and independent decisions and to express their inner thoughts freely. Obedience as such, they say, has no place in child care and should never be exacted; all behavior should flow freely from within outward. "Self-expression," in other words, should be supreme.

As a general principle in child care, it can be said that *extreme views are seldom right*. So in this case, neither extreme of discipline is desirable. Parents represent all authority to the young child. The attitudes which he develops toward them are important to his attitude toward all authority in adulthood. Whether he obeys the laws of his state or church, whether he obeys the dictates of convention, of society at large or of his own immediate group, or whether he defies these laws and dictates, will in large measure be determined by his habit of obedience to the authority repre-

* Smart and Smart³³⁰; Gruenberg¹⁵²; Washburn.³⁸⁵

sented by his parents, his home and his school. Many writers believe that the child must respect his parents as worthy ideals and as worthy censors of his natural behavior if his growth is to be sound. Parents must serve, then, as worthy examples of behavior and as worthy disciplinarians if the child is to develop an effective "super-ego" or "conscience" with which to discipline and control his primitive instinctive impulses.

Instant and Unquestioning Obedience Is Undesirable.—If as the result of a program of extreme rigidity in discipline an individual goes through childhood yielding instant and unquestioning obedience to authority, we can scarcely expect him to behave differently toward authority in adulthood. He will, if sufficiently trained in docility, do anything he is told. He will, if trained to depend on other judgments than his own, be unable to think for himself. The freshman who enters college unable to decide where to live, what courses to take, what clothes to buy and which friends to make is a familiar spectacle to every dean. Being unable to resist commands he does as nearly as he can whatever he is told to do by anyone, no matter how unwise for his own welfare the commands may be. Such docility is the usual reaction of the introvert child brought up under a regimen of instant, unquestioning obedience.

The introvert child may, however, react to rigidity in quite a different way. Instead of becoming docile he may develop the habit of sullen withdrawal, growing up to resent direction and to react to it by pouting or sulking, or he may give surface obedience but live in reality a life of stubborn resistance. In this case he usually becomes apt in the art of deceit, appearing to do what he is not really doing and appearing to think what he is not really thinking. This is the essence of hypocrisy.

On the other hand, another type of child is likely to react to repressive authority by open rebellion, and may grow to adulthood with a completely negative attitude toward authority. Such people are familiar to us as needing to be "handled with gloves." They are unable to hold positions because they "fly off the handle" when given orders; they "simply can't stand to be bossed." They are the anarchists of the world, the typical "aginners," being against anything which smacks of authority. Every college dean knows these people, too—the students who want to cast aside everything that is upheld by convention or tradition for the naive reason that they "can't tolerate being dictated to."

Unlimited Freedom of Behavior Is Also Undesirable.—Perhaps enough has been said to make it clear that the “instant and unquestioning obedience” program is not conducive to sound growth for any type of child. Let us analyze the program at the opposite extreme where unlimited “self-expression” is encouraged. The child who gets the idea that he need obey no dictates but those of his own impulses is indeed in a false position. He may soon discover (for his own welfare we would hope the lesson would come early) that even though his impulse may crave flying across the room as if he were riding an airplane, he may not do so because the physical law of gravity is more powerful than his wish. More serious than this, he may wish to live his days without eating vegetables only to learn too late that impaired health results. He may try to express his impulses of snatching toys or of striking other children, only to learn that he is soon ostracized and left to play alone. Breaking the neighbor’s window or pulling up his father’s garden is hardly to be condoned simply because he happens to feel that he is expressing something inside himself. Yet, hard as it is to believe, there are parents who actually fail to see that such extravagant “self-expression” does not free the child but only makes him the slave of his own whims. Impudence or lack of consideration for other people should never be confused with independence or creative expression. They are utterly different.

Both Freedom and Self-control Are Necessary.—Sometimes this attitude of reverence for the child’s wish is only a compensation on the part of parents who, refusing to work on the old principle of despotism in child training, feel the necessity of working on some sort of principle, and have found nothing less extreme than a complete “hands off” policy. Yet, as Seabury points out, few parents have the courage to exercise this policy to its natural conclusion. They give the child extreme liberty until they find him about to learn a severe lesson as the result of some inexpert choice of behavior; then they step in to protect him from the natural consequence of his action, and hence deprive him of the opportunity to learn *the need of natural restraint within liberty*. Parents who give verbal loyalty to the principle of “self-expression” but who lack the courage to let the child learn the discipline inherent in such a policy are doubtless the parents to whom Seabury refers when he says: “Thousands of American homes are without the ancient despotism in child training. There is only an empty void

in its place. These parents cannot accept or successfully apply old ideas, and so they apply none. Son and daughter grow up in a protected, loose, undirected liberty, sure that they will be supported, taught not to exert themselves, made to be parasites, permitted to be self-indulgent, helped to be indolent. Tragedy results."*

The Wisdom of Explaining Reasons before Asking Obedience.—There are also parents who think that obedience should never be expected unless the child understands the full reasons for his action. On the whole this is an excellent principle, but most children soon learn that if parents are always ready to explain reasons they may be side-tracked from carrying out commands or persuaded to withdraw them altogether when bombarded with enough "whys." Children should never be allowed to use "why" as a means of postponing obedience once they really understand the nature of the command given. We must, of course, make sure that commands are really understood before we become arbitrary about seeing that they are executed. We must realize, too, that there are certain emergency occasions when commands must be obeyed instantly for the sake of safety and other occasions when the reasons behind commands would be incomprehensible to the child. Implied in both of these cases is a habit of obedience to an authority which the child has learned from experience is reasonable, consistent, and interested in his own ultimate welfare. To delay obedience under such circumstances because of insistent "whys" would be either dangerous or unreasonable.

Some General Rules for Obtaining Obedience.—A few rules may help in this respect:

1. Before giving a command take care to gain the child's attention.

2. Phrase the command in language that he can understand. A four-year-old, for example, does not understand "in the upper right-hand drawer you'll find so-and-so."

3. Enunciate slowly enough and clearly enough to be sure he follows you. Children of less than five are still learning to distinguish the meanings of individual words.

4. Do not give too many commands at once. A child of five can execute three exceedingly simple commands at once, but only if they are repeated at least once under concentrated attention before he sets out to obey.

* Seabury.³¹⁹

5. Be consistent in commands. Do not tell him to do one thing today and a contrary thing tomorrow.

6. Ask him to do only the things you really intend to have him do. Do not, because you have not stopped to think, or simply to show your authority, give needless commands which you do not carry to completion or which you lightly withdraw when you realize their uselessness.

7. Be sure that you are reasonable and right in your requirements; then see that commands are carried out.

8. Do not give commands or allot punishment in anger.

9. Do not use threats or bribes as a means of gaining obedience.

10. Do not make misbehavior interesting by making it exciting or profitable.

Developing Desirable Attitudes Toward Authority.—On the whole the child should have a gradually developing experience in independent judgment of authority, since adjustments to authority comprise one large class of adjustments necessary in adult life. Whether we wish to admit it or not, no individual can do as he pleases. He may fondly imagine that there is no authority outside the realm of his own individual autonomy, but in practical living he must constantly make adjustments to physical and to social law. He must recognize that, no matter how much he may wish to place his hand on a hot stove without burning it, he may not do so because physical law dictates that flesh becomes injured by burning when exposed to a given temperature. He must learn that society has organized itself according to a mutually agreed upon set of traffic rules, and that, even though he as an individual may wish to disregard a red traffic light, he may not do so without danger to his life and the lives of other people because the rest of society regards the counter green light as a "go" signal. The same principle holds of the less well-codified social laws: Individuals are not autonomous in themselves but must accept the inevitable consequences which follow, entirely regardless of individual wish, upon the heels of specific types of behavior. For example, there are certain rules for friendship—rules of fair play, of generosity, of respect for other people's wishes as well as for one's own—rules which can be broken only at the cost of loss of friendship. Thus, infringement on social law or rule, like infringement upon physical law, entails specific consequences. It is no good to say, "I am a law unto myself." No one is a law unto himself. Adjust-

ment to law and authority is absolutely necessary to sound mental health.

What a Desirable Attitude toward Authority Is.—Each individual must learn what constitutes a desirable adjustment to authority, and the sooner a child begins his lessons in this type of learning, the better his adjustment will be. What is it, then, that he must learn in order to achieve a sound adjustment to authority:

1. He must learn what constitutes a good and desirable authority: What kind of law it is wise to obey; what kind of superior wisdom and experience it is desirable to consult.

2. He must learn what constitutes a bad authority: What kind of opinion it is wise to disregard; what kind of advice is worthless or vicious.

3. He must learn self-discipline enough to comply with a good authority.

4. He must develop strength of will enough to resist a bad authority.

Real wisdom in judgment of authority and real courage in acting upon such judgment comes only as the result of practice. Children should, therefore, be encouraged to assume such responsibility as rapidly as they have achieved enough experience to make their judgment sound; they should be taught to weigh good advice, yet to value their own experiences for whatever those experiences may be worth. They should, in other words, learn to achieve that fine balance of adjustment to authority which means compliance without weakness.

Need to Grow at Own Rate.—One more over-all need should be mentioned. Every child has the need to grow at his own rate. This has been enlarged sufficiently in Chapter I. We need here to develop a little further the discussion of what happens if this need, or any other basic need, is not met.

When Basic Needs Are Thwarted.—When any basic need is frustrated or thwarted, the human organism struggles in its own way to bring about the expression or fulfillment of that need. Sometimes the struggle is a little like the behavior of an experimental cat in a trap; the child strikes out blindly in all directions until eventually, by trial and error, he hits upon some means of expressing the inhibited drive or of finding a substitute satisfaction. For example, an extrovert child, deprived of active play space and facilities, is likely to scatter his pent-up energy to no useful

purpose, running distractedly from spot to spot, picking up everything he can lay his hands on and either banging or examining or simply throwing it. This is typical behavior of pent-up, city apartment children, especially boys, of run-about or later age. Since no constructive outlet is provided for the need for activity, the child utilizes whatever is at hand. Much of what he does under such circumstances is labeled destructive by the adults, and an active battle between adults and child is likely to result. Even though spankings, nagging and removal of adult approval result, none of these suffices to curb the child's drive to activity which can very easily turn itself to the excitements and satisfactions of continued battle with people. For such a child any activity, in other words, even though it is activity which deprives him of other basic satisfactions, is better than no activity. This is true of many children in whom the need for activity is one of the most basic drives and will function even at the cost of other basic satisfactions.

Not all children are like this in reaction, however. Some children are so dependent upon the show of love and approval of the parent that parental discipline proves stronger than the drive for activity. Such a child may become tense and sleepless, and develop thumb-sucking, nail-biting, head-banging, body-rocking* or some of the other less vigorous forms of activity. "Nervous" habits, so-called, are often a substitute release for activity which has been denied more natural and vigorous outlet. Nervous habits may be due to other causes, of course, but this is one fairly common cause of them. Very imaginative children often substitute mental activity for the physical activity which is denied, and will develop fantasies of active play or will day-dream of other substitute satisfactions.

Children Forced beyond Natural Growth Rate.—If children are forced beyond their natural growth rate (see, *Ambition of Parents for Children*), they are likely to develop substitute activities in order to find outlets for the accumulated strains. They may develop destructive physical activity which in later years becomes outright delinquency. Or, as stated above, they may release the energy in various nervous habits, including muscle twitches and

* Ribble²⁹² (p. 109) says: "The unmothered infant, if he is vigorous and robust, will stimulate himself with various kinds of rhythmical body activities if the normal fondling and rocking are denied him." This will also occur in the child whose drive to activity is thwarted.

jerking in sleep. These may be associated with nightmares in which the child is pursued by some animal or terrible person who is the symbol of the pursuing or driving parent. Or the general fear that they are not satisfactory to their parents may turn into a fear dream of almost any sort.

The less aggressive child may withdraw, appearing to be bored with his surroundings because he would rather appear to be bored than to admit that he cannot compete successfully with the standard his parents hold for him. Day-dreaming and fantasy are fairly common even in preschool children. Sometimes overdriven children fail to gain weight satisfactorily; occasionally they develop chronic digestive disturbances. Motor blocking sometimes occurs, so that the child seems distressingly awkward or manually inept; stuttering may occur. There are other ways in which overdriven children show strain or develop satisfactions as substitutes for the more usual behavior patterns. These, however, may suffice to show how the observant parent may detect signs of forcing. It must be remembered, that there are numerous other causes for each of these above disturbances of behavior, any one of which or a combination of which may be due to quite different causes.

PARENTAL ATTITUDES AND PRACTICES

The Emotional Climate of the Home.—The general atmosphere of the family, or the emotional climate of the home, is to the growing child what weather and climate are to the growing plant. Because of it the child grows and prospers socially and emotionally, or he is stunted and warped. Even in early infancy the child's general physical and personal well-being respond to the family atmosphere. This is particularly true for young infants as the family atmosphere is revealed to him by his mother's love and care. Ribble²⁹² says that it is difficult to draw the line between the infant's physical and his personal needs. However, once the infant is made comfortable physically, if administered to with a kind hand he is stimulated into a sense of aliveness and well-being, and he develops a consciousness of personal contact to which he responds positively.

The emotional climate in most normal homes is, fortunately for the children in these homes, one of warmth, understanding and mutual support. In it the child finds emotional security, a good pattern of adult behavior and personal relationship, sound disci-

pline and the fulfillment of his major physical and emotional needs. Some homes, unfortunately for the development of the children in them, create an atmosphere of antagonism, suspicion, distrust, selfishness and mutual competition. In such homes the children suffer from lack of sound affectional security, steady discipline and inspiring pattern for personal behavior. In an atmosphere of competition selfishness prospers. In mutual personal distrust the child learns to suspect all people of ulterior motives, and to lie or evade situations in order to get things for himself. Openness, frankness, honor and confidence in love cannot be found in such homes. Only when the family atmosphere is one of genuine love, unselfish living, pursuit of honor and mutual welfare can children develop adequate confidence in themselves and in family life in general.

Parent-Child Relationships of Extreme Importance in the Development of Children.—In family life one of the most important factors influencing the growth and development of the child, especially his emotional development, is the relationship existing between parents and child. Fundamental to this relationship are such considerations as the amount and kind of affection existing between parents and child, the amount and kind of discipline given by parents to the child, the ambition parents hold for the child and other similar considerations. These relationships are the ones which grow out of the child's inner needs for love, discipline and growth at his own rate. We have already discussed discipline. Let us now look at the other two needs from the point of view of the parent.

Amount and Kind of Affection.—Perhaps the first thing parents think of in connection with their relationship to their child is how much they love him, or as sometimes happens, how much bother it is to have him about. It seems impossible to most people that parents could fail to love their children, yet some parents do fail in this respect.

The general type to which the child belongs determines in some measure what his reaction to insufficient love will be. He may brood quietly, withdraw into himself and perhaps develop an abnormal appetite for affection, though giving the appearance of hard indifference to it. Or he may throw himself into busy activity in an attempt to forget the slights of his parents. Depending upon his type he may grieve himself into illness, or he may become delinquent and destructive, taking out his resentment on the world

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that the world owes him constant evidences of love and appreciation for which he need make no effort or return. It seems fairly evident that none of these reactions to excessive appreciation, protection or fondling are conducive to successful or desirable personalities. Least of all do they prepare an individual for the understanding and skill in love which are essential to happiness in marriage.

Another common practice with children, doubtless often motivated by a desire to insure the development of social technics which will make them socially attractive, is to encourage them to "play up to" and caress people in general, in some cases even strangers. We may well pause thoughtfully when we see in a nursery school center a three-year-old child who approaches every newcomer with her arms held up and the demand, "Love me." It is unwise to teach children to kiss people indiscriminately—the habit is too likely to fix itself.

Psychologists Differ about Physical Caressing of Children.—There are still some advocates of the behavioristic school of psychology who lay the blame for some forms of adult neuroticism on the fact that children have been given too much physical caressing by their parents. These writers recommend that children be given no physical demonstrations of affection at all, but that they be weaned from the breast as early as possible and that they be handed a bottle propped up on pillows so that the child will not have to be held by the mother even while feeding. They suggest rigorous routinization of the child's schedule with strict attention to the clock in the conduct of the child's day. There is to be no kissing, petting, rocking or holding of the child. The danger, they claim, lies in making the child too dependent upon the parent, and in the possibility that the child will become emotionally fixed upon the parent and unable later in life to free himself from this "silver cord."

It is, of course, possible that a frustrated wife may direct her adult sexual energy into an excessive and overstimulating physical caressing of her baby; or that an unsatisfied husband may take a warped psychological possession of his child. Psychoanalysts point clearly to cases of unhappy marriage and of adult neuroticism which are due to overpossessiveness of children by parents. It must be remembered, however, that most caressing of babies and children by parents is not the product of sexual frustration on the part of the parent. Most parents kiss, pat, rock and cuddle their

children because they love them with sincere and wholesome love. Two points need to be made in favor of such demonstrations of affection: one, that young children understand only concrete situations, and physical caresses are concrete demonstrations of love; and two, that unless love is freely expressed in the child's life he cannot learn how to express love, and hence will be ill-prepared for marriage.

Another point should be considered in this connection. Children differ widely in the amount of love they seem to need. Some children need little more than kind treatment and a loving tone of voice; they are so busy with their own affairs that too much caressing becomes an interference with their activities and they tend to brush it off in a self-sufficient manner. Other children are very dependent upon demonstrations of love and constant reassurance that they are secure in affection. These children seem able to absorb an endless amount of petting and caressing. The one type of child needs to be given caresses at the moments when he can find them comforting and fulfilling so that he will not grow up to be too off-hand about it. The other type of child needs to be weaned gradually into greater interest in self-sufficient activities so that he will not be overly dependent upon petting.

Weaning from Infantile Forms of Affection Necessary.—A gradual weaning from the intimate physical contact with the mother which exists in the prenatal, and later in the nursing situation is necessary as the child grows. So, too, is it necessary for him to be weaned from constant petting and physical reassurance that he is loved, since he must learn to accept separation from his mother when he enters school, and this separation must be complete enough so that on finishing high school he can leave home to earn a living or to take further training. He must learn to transfer affection to a wife if he is every to marry successfully; hence he must learn the difference between parent-child caresses and husband-wife caresses. Being petted as a baby is one thing, but love in adulthood means that one gives as well as takes both physical caresses and psychological affection (see *The Development of the Love Impulse*).

Symptoms of Wrong Kind or Amount of Affection.—We may turn for guidance in the matter of desirable amount and kind of parental affection to a brief survey of symptoms which are pretty sure to appear in the child's behavior if all is not well. Any deviation from the average in a child's emotional expression should

suggest to the parent, teacher or clinical examiner at least the possibility that the environment of affection needs investigation. Emotional apathy, emotional instability, excessive shyness, excessive boldness, negativism, feelings of inferiority, excessive demands for attention, jealousy and too great or too little dependence on adults may any of them indicate difficulty in this field. Simply to judge one's affectional relationship to one's child by watching for such symptoms is, of course, a negative approach. A positive approach is obviously better, for if we wait for symptoms of wrong relations to appear we will probably find it exceedingly difficult to bring about changes in these relations. Well-loved children are busy with their own affairs, yet reach out for adult support when in difficulty; they are happy, reasonably calm emotionally, accept physical routines and give evidence that life is good. Prevention is vastly more efficient than belated cure, since it avoids useless waste of time, energy and what is more important, human happiness. Moderation is a safe rule. A balance should be maintained so that physical expression shall neither be rebuffed nor allowed to exist in and for itself, yet so that children learn to value expression of affection and know how to give it.

Love Should Not Be Used as an Instrument for Discipline.—Another abuse of the love relationship between parents and children is the use of love as a disciplinary measure. "Mother loves you when you're good," "Daddy can't love you if you are bad," are commonly used as lashes to whip children into shape. Oftentimes if the verbal appeal is not sufficiently powerful with a young child he is rewarded for good behavior with ardent caresses, or the parent conveys the idea of hurt feelings with pretended sobs. Such methods are usually extremely effective in producing immediate results, since children are notoriously tenderhearted. There are several reasons, however, why we should not govern children by this drama of affection. One reason is that it is so effective, it tempts us to excess, with the attendant evils of excess which have been discussed above. More than this, we must recognize in this connection a fundamental principle in child care: Excessive stimulation of any emotion in childhood should be avoided whether the emotion be one of fear, anger, grief, exhilaration or love. Another reason why we should avoid the use of love as a disciplinary measure is that if we love a child at all we must of necessity lie to him when we say that a single bit of behavior can win or destroy that love. He can gain from such state-

ments only an example of lying, or, if not that, a false notion that love is something to be lightly given or withdrawn as a reward or punishment for trivial bits of behavior.

To summarize the discussion of affection let it be said that children should receive enough affection to make them feel secure in love, but not so much of the overprotective, overdemonstrative kind that they are cut off from independence or are given an excessive appetite for appreciation and physical demonstrations of affection.

Adopted Children.—Perhaps a word should be said here about adopted children. If taken early in life, preferably in infancy, adopted children can be given as much affectional security as can own children. In many cases adopted children are far more secure affectionally than are some own children, since the adopted child is unquestionably a wanted child, whereas not all own children are.

One thing seems absolutely clear to every child development expert and every social worker who handles adoption cases. Adopted children must know they are adopted from the beginning of their adoption. Infants, naturally, cannot understand this; but there should be no time in any adopted child's life when he is not aware of the fact that he is a foster child, and along with this fact, that he is, because of this, an especially cherished child.* Only in this way can one avoid the disaster of discovering the fact by accident, or when marrying, or getting a passport for travel. No child can believe that he would not have been told frankly and simply about being adopted unless there were something to be ashamed of in the fact. The secrecy to him can be interpreted by him only as the result of shame by the foster parents. If it were all right, he thinks they surely would not have hidden it from him. Nothing reassures the adopted child more than to have the fact of his adoption openly accepted as something cherished and precious to all concerned.

Love is not an automatic product of birth by blood. Many blood relatives hate each other cordially. Love is, rather, the

* A book which helps foster parents to present this to preschool children is Wesson, V. P.: *The Chosen Baby*. Philadelphia, J. B. Lippincott Company, 1939. Other books of great help to foster parents are Post,²⁷⁹ Chapter 15; Brooks⁵⁶; Gallagher¹²⁶; Prentice²⁸²; Sayles³¹¹; also helpful are pamphlets put out by the New York Committee on Mental Hygiene: *About Foster Children* (for social workers, nurses, foster parents) (price, 25c); *To Foster Parents: This is Your Foster Child* (price 10c), 1944.

product of long association, shared interests, mutual services and abundant memories of happy times together. Adopted families often have these interests and memories even more than own families.

Ambition of Parents for Their Child.—This has been discussed under the topic, Forcing Growth. There are, however, a number of aspects of the attitudes and expectations of parents which we include here. One of the relationships between parents and children which is extremely important to the development of the child is that of the ambition of parents for their children. Since self-preservation is a first law of life, it seems natural that people should be more interested in themselves than in anyone or in anything else. The chief exception to this principle is the interest that parents have in their children, for children, being the first extension of their parents' egos, are often identified with the most intimate thoughts and secret ambitions of those parents. This identification of parent with child, this refusal to grant the child an individual personality (ego) of his own, is one of the greatest sins of selfishness. In its most generous form one sees self-effacing parents who make every sacrifice that their child may have possessions and privileges denied them in their own childhood. We hear these parents say, "Bob will never have to work as I had to," or "Betty is going to have all the good times I missed when I was a girl."

Protection of Children Should Still Permit Growth.—In so far as work and suffering are a detriment to growth, children should, of course, be protected from them. Abuses of children and the understanding that abuse is destructive to growth have led to child labor laws, children's protective agencies and similar expressions of the desire to spare children undesirable hardships. We must not, however, lose sight of the fact that a certain amount of striving for achievement, of struggle for fulfillment is fundamental to rapid and desirable growth.* Overprotected children, like overindulged children, suffer a handicap for the very reason that they have been denied the opportunity for strength which struggle gives. Parents who deprive their children of struggle and discipline deprive those children of the very experiences which lent strength and meaning to their own lives. They fail also to realize that gifts too easily acquired cannot be appreciated for

* Adler develops this thesis clearly in his "Practice and Theory of Individual Psychology."³

their full value, and hence these indulgent parents find themselves bewildered when their children attach little importance to the so-called "blessings showered upon them."

Parents Should Recognize That Children Differ from Themselves.—In its less generous form the identification of parent with child becomes a refusal to understand or tolerate the fact that children are not duplicates of parents—a refusal to grant the child any individuality in wishes and desires. Sometimes we hear a mother say, "Betty wants a bicycle for Christmas, but when I was her age I was just crazy for a doll. I've the most beautiful doll for her; I just know she'll love it." And Betty's disappointment on Christmas morning leaves the mother with only a bewildered self-hurt, but with no clearer understanding that Betty is not a duplicate of herself. One father who had always wanted to be a lawyer refused to permit his oldest son to study for medicine because "the young scoundrel doesn't know the thrill of arguing before a jury. Just wait until he's tried it; he'll be grateful to me for insisting." The father, denied expression of his own wish and intent upon molding a law career through his son, failed to see that he was denying his son the same expression of an equally strong wish. This desire of parents to live again through their child, to find in him the pleasures they missed and the satisfactions they failed to achieve, is an urge to make up through the child for the disappointments and failures of their own lives, and is detrimental to the development of the child.

Reflected Success.—Less specific than these urges to live the detail of joy or disappointment through the child is the general urge to find success through the child in no matter what form. In this case the parents do not force any specific career upon the child, but insist upon success wherever the child seems most likely to achieve it. Difficulty often arises here when parents, refusing to recognize mediocre or inferior ability in the child, drive him far beyond his natural ability. Many modern families who have never boasted a college graduate have come into enough financial prosperity to afford these four additional years of training. They insist that the son or daughter must go to college even though the child, either recognizing his academic limitations or finding his natural level or success in mechanics or business, begs to be spared. In many cases parents insist because college represents to them a generalized brand of success, even if it is only an indication that father has succeeded well enough to afford four more non-earning

years for each of his children. Thus we see the desire for glory and success in a reflected form. The parents live success if their child succeeds; they feel their own egos inflated when their child has achieved glory.

The urge of parents for the feeling of success through their child takes another form. If a child can recite an endless chain of nursery rhymes when he is two years old, or if he can graduate from high school at fourteen, thus persuading people to remark, "What a bright child!" parents can feel, "He is mine; he inherited his brightness from me; therefore I am brilliant." Or, if he can be trained to perfect manners at a very early age, people can be encouraged to remark, "What a well-trained child. He must have very unusual parents," thus gratifying the parental ego directly. Such commercialization of the child for the sake of parents is usually entirely unconscious on the part of the parents, but it is unfortunate nevertheless.

We have also the abundantly successful parents who need to find no vicarious or compensatory success in their child, but who feel that they have a tradition to maintain. The father belongs to "a long line of doctors," the mother to "a long line of musicians," and so on. These parents, proud of their own success and of that of their forebears, can tolerate no let down in the family tradition. Regardless of individual capacity or interest, therefore, the child must carry on. Sometimes this "family tradition" is set by an older child who succeeds brilliantly in business or in music, so that a younger child, neither able nor interested in these lines but drawn toward another line of work, is regarded as disloyal if he fails to follow the pattern set.

The Urge for Success Is Sometimes Dangerous.—Sayles^{311a} says, "A natural and inevitable accompaniment of normal parental love is the wish to see the child succeed." It is not the parental wish to see the child succeed that is dangerous; often the very wish for success and faith that it will come is the motive which produces it for the child. Trouble arises when the parental wish becomes selfish. When the major drive behind the wish is gratification of the parental ego or a desire to live again one's own life through the child, parents rob the child of individuality, and force the development of interests that are not native, or dwarf capacities that should be dominant.

Again, trouble results whenever parents refuse to accept inherent limitations and continue to drive beyond native ability.

No amount of hard work can make up for serious native deficiencies. Nothing but failure can come to a child driven beyond reasonable effort. Whenever a child has made a serious effort, the feeling that he has failed to meet the expectations of his parents is disastrous. Continued disappointment of parent in child produces a discouragement which inhibits even the measure of success that would otherwise be possible. The child in school who does not even try because he is too discouraged or too terrified of failure is a familiar spectacle. One of the most brilliant women chemists in America has never found the happiness or self-assurance due her from her work because her father has never allowed her to forget that she failed him when she failed to become a musician.

The Effect of Praise or Blame Is Important to Children.—The whole subject of praise and blame is involved here. Too ready praise can breed habits of laziness and self-complacency. Lack of serious competition or lack of sufficiently high standards of accomplishment are almost sure to leave wells of capacity undeveloped. On the other hand, too constant blame can breed habits of failure and self-effacement. Too serious competition and too rigid standards are almost sure to blight development.

As a general principle, however, comments on successes make learning proceed faster than do comments on errors; praise is more effective in teaching than is blame. Myers²⁶¹ has made clear that the method of teaching children by celebrating their successes has a great advantage over teaching by nagging about mistakes. This does not mean that pointing out mistakes is to be avoided in every instance, but means that the emphasis should be laid on the right learnings rather than on the wrong ones.

The chief thing to be borne in mind in this connection is that parental ambition must be adjusted to the capacity and the interest of each individual child. Standards should be high enough to exact maximum development of native capacity, but flexible enough to adjust to incapacity. Praise and blame should be awarded according to effort as well as according to product, and the concept of success should be broadened to include the achievement of a good disposition and of a desirable social viewpoint, and should not be limited to the attainment of material prosperity.

Growth Must Result in Independence from Parents.—Throughout this discussion it can be seen that parent-child relationships

must change as the child grows. In early infancy the child is completely dependent upon the parent for everything, his physical well-being, his psychological stimulation and his emotional security. As he grows he gradually takes over for himself his own physical care, his pursuit of interests and his social contacts; his emotional security passes gradually from being centered upon his parents to being centered in things and situations under his own control. He is not grown up emotionally until he has learned to meet life on his own initiative and responsibility. There is, then the problem of weaning him, at first physically from his mother's breast; but also, as he grows, he must be weaned psychologically from dependence upon his parents for economic support, for thinking and decision-making and for emotional security and satisfaction. Socially, his exposure to other people's standards and ideas comes at around two years or even sooner, when he meets other adults than his parents if only during the brief hours when he is left in the charge of a person other than his mother. It progresses as he is exposed to other children and the patterns of behavior and standards the parents of these other children hold for them. In school he is legally under the control of teacher and principal; later he is deeply influenced by the ideas and ideals of his gang, especially of his adolescent gang. Ultimately he must live economically, socially and emotionally as an adult, fond of and respectful to his parents, yet entirely independent in his decisions and his behavior, in his choice of friends and of his mate. Parents must think of their children at all stages of growth as heading for intelligent, independent adulthood.

This need not mean that in achieving growth of independence the child is to be weaned away from love of parents and home. Quite the contrary, for the child who can gradually become an independent personality within his home seldom feels anything but devotion and loyalty for parents who understand him so well and who prepare him for life so wisely. On the other hand if the child in his attempts to achieve independent development and social responsibility is met only with accusations of "disloyalty to his parents," and with repressive discipline which mistrusts his growing judgment and insults his growing maturity, he can do nothing but chafe against the restraint and break away at the first possible opportunity.

Parents Must Aid This Achievement of Independence.—Parents who are wise will grant freedom gradually and increasingly, and

will welcome rather than resent signs of a desire for independence on the child's part. It is a natural temptation for parents to rejoice when children remain content to stay at home, to limit their social and spiritual contacts to the family. They are likely to speak with pride of the child who is devoted to his family, saying, "He's simply miserable when he's away from mother and me," or of the boy who "never has fallen in love with any girl—he's devoted to his mother." "He never plays with other children long; he'd much rather stay at home with me," affords the child's mother satisfaction; but it is an immediate danger signal to the psychologist whose profession makes him alert to signs of difficulty in mental or personality growth.

One mother who kept her robust five-year-old boy in babyish clothes betrayed herself in words as well as in deed one day when she brought him to school. He struggled until he released his hand from hers and, running joyously down the hall burst into the schoolroom where, quite obviously absorbed in his plans for the day, he set to work immediately. The mother whose lip was trembling because he had forgotten "to say goodbye" stood in the doorway where she attracted the attention of the teacher. "He seems very happy here, doesn't he?" was the teacher's attempt to make her feel better. "Yes, I'm afraid so"; and the mother lost control as tears welled up in her eyes. She had brought herself to enter him in school because of the pressure from her husband, her friends and her own conscious mind, but unconsciously she wished him to be unhappy and incapable of interest when he was away from her.

Parents Do Not Always Realize When They Hinder This Growth.—The mother or father who brings a child to the nursery school, then stands bidding him intensely affectionate goodbyes until the child is worked into a frenzy of weeping over the tragedy of separation, is in reality gratifying his own unconscious wish that the child should be miserable at parting. The parent who meets the traditional demand that children be associated with other children yet who by criticising each playmate subtly destroys whatever affection the child may develop toward anyone outside the family is using an insidious weapon. Such parents may even appease their conscience by "inviting little friends" to their homes, or by insisting that their children accept invitations to visit elsewhere. Yet they succeed effectively in dwarfing each interest which would provide expansion of the social self beyond the home, and

each idea which would stimulate independent growth of the spiritual self.

It is interesting that some parents can stunt the growth of their children, and can inflict or wish to inflict unhappiness. It is notable too that the very parents who talk most about devotion to their children and to "family life" are often the ones most prone to inflict such pain upon their loved ones. This can happen because emotions frequently blind intellect. No clear-thinking parent would consciously place insurmountable stumbling blocks in his child's path to progress. Yet, the wish to control all the life of a beloved person, the emotional jealousy of interests and persons who command a share of the loved one's attention, are often more powerful than the intellectual desire to free that personality for growth.

In the Process of Growth the Child Must Meet Extrafamilial Influences.—The first contacts outside of the home, even those made when the child is only two or three years old, almost inevitably mean exposure to behavior and to ideas that differ from the ones taught at home. The child learns new games, new words, and new mannerisms. In most neighborhoods the new learnings will fit the ethical code of most of the parents who compose that neighborhood, so that the major part of what the child learns outside the home, though different, will be acceptable. Some of the learnings will be different enough, however, to meet with disapproval. It is when this happens that the temptation to forbid extrafamilial contacts become most severe. It is well to remember in this connection that not all standards which differ from our own are wrong, and also that even though a given child may have one or two undesirable traits, much good can be found in all children. To forbid contacts may be to forbid valuable opportunities to learn these two facts about life. Judgment is required here, as everywhere in child care. Some types of behavior are, of course, to be forbidden if standards are to be established for the child. Our emphasis here is simply a warning against blindly forbidding anything which is new or different—against intolerance and the slavish binding of one's child to oneself.

METHODS OF STUDYING SOCIAL AND PERSONALITY DEVELOPMENT

The measurement of social and personality growth presents problems of even greater complexity than the measurement of

physical growth. Social and personality growth data are far less definite than height, weight, the appearance of teeth or even an x-ray plate of bones. Children's behavior varies from situation to situation and depends upon the form of stimulation, the state of physical fatigue and many other factors. Particularly difficult to evaluate, or even to see, is the force of inner drives and wishes which are often the strongest motivation behind a given piece of behavior. Because of these factors it is very difficult to standardize scales for the description of behavior, much less for the accurate evaluation of such a description.

A good deal, however, is known about the general patterns which social and personality growth take. We know, for example, that children play with one or two children and learn how to adjust to these before they are able to participate in larger groups. And we know that as they adjust to larger groups they are likely to follow a given pattern in their attempts to do so. Thus we have a foundation for a rough social maturity scale. We know, also, that children express emotion openly, vigorously and without control before they can learn the various steps toward the adult or mature pattern of emotional control. Since we know fairly accurately what the sequence of these steps toward control is, we have the material for a rough emotional control maturity scale. However, the steps in these scales are still in the process of exploration, so that there are many holes in our knowledge about the patterns by which children develop socially and the stages through which they pass in the achievement of personality maturity.

Many devices have been tried by workers interested in studying this development. These devices range all the way from attempts to create exact age scales based upon open or overt and hence observable behavior, to attempt to understand the deep, inner emotional life of the child.

The devices for studying outer or observable behavior are defended by some workers in the field as being the only methods for studying social and personality development that "can be counted upon." The feeling of these workers is that what can be seen and heard one can be sure of, whereas one can only guess at what goes on inside of the child. Other workers scoff at this idea, saying that it is exactly what is seen and heard that cannot be counted upon, since one has no idea what the child meant to say or do, or what inner feelings and attitudes are being expressed in any given piece

of behavior, no matter how obvious it may appear to be on the surface.

There is something to be said for both viewpoints, as there is something to be said for most of the devices employed by both groups. In actual fact, most of the methods developed for the observation of outer behavior and for the study of inner feelings and attitudes have something of the other viewpoint in them. Observers of outer behavior know that they cannot be sure, but must, nevertheless, be aware of the inner drives. Conversely, inner drives and meanings can be discovered only by the observation and study of what the child does and says.

Devices Used Primarily for the Study of Outer Behavior.—We cannot attempt even to summarize the wide variety of methods which have been tried, and often discarded as ineffective, in the past twenty years to get concrete and definite pictures of children's behavioral growth. For many years attempts have been tried which would obtain data as definite as a height or weight figure and hence could be handled statistically. Of these attempts some have survived. There are now available a number of *check lists* of personality traits, or descriptions of behavior reactions on which a teacher or parent may check those traits or reactions which they think apply to the particular child under consideration. These are useful for reminding the adult to look for and observe certain traits or situations which, in a free-running description of the child, they might forget to mention. The assumption on these check lists is that if an item has not been checked, it was not present in the child at the time the observation was made. Kept over a period of years these checked lists thus serve as a rough record of the time certain traits appeared and how long they lasted.

Some of these descriptive check lists have been "weighted" numerically, thus not only giving the observer a numerical value to use statistically, but giving a rough estimate of the degree of the trait present. For example: "Plays with other children: always (5) usually (4) average (3) seldom (2) never (1)" gives not only the fact that he does or does not play with other children, but roughly how much, and assigns a numerical value which can be handled statistically.*

* A good example of this type of rating scale is the Read-Conrad Behavior Inventory at the Institute for Child Welfare, University of California. See Read and Conrad.²⁸⁷

A defense of the check-list method lies in the fact that case studies which are chiefly descriptions of children are not sufficiently quantitative to be used in statistical studies, or for objective comparison of one child with another. Check lists permit groupings of children into traits to be studied, and give a short and easy-to-see summary of materials which in descriptive case studies often takes up many pages. Numerical evaluations attached to the check lists provide data which can be handled statistically. Numerical evaluations are sufficiently convenient, however, that they often tempt investigators to an indiscriminate overuse or misuse of the device.

Another device which has had, and still does have a good deal of use in studying the social group relationships of children is the *sociogram*.^{*} In this method *groups* of children are watched closely, and each contact any child makes with any other child is recorded. With these observations in hand a sociogram can be sketched in which the number of contacts made by any given child can be studied, as well as which children he sought and which children sought him.

Another way of studying group interrelationships is to ask children to say which other children in a group they like best, next best and next best, until the entire group is ranked by each child. The total rankings can then indicate which is the most popular child in the group on down to the least popular. It can also indicate, as can the sociogram, which children tend to cluster into small play groups or preferred cliques. These devices and many others like them have helped our understanding of group formation as well as our knowledge of how individual children adapt to group associations.

There are a number of other methods used for studying the outer behavior of children, but these will suffice to indicate the type of devices in current use. They have yielded much information about children's social and personality growth and are the means by which many of the things we know about overt social behavior were discovered.

Attempts to Evaluate and to Interpret the Inner Emotional Life of the Child.—As we have seen, the behavior of children, even the part we can see and hear, is extremely complex and, therefore, hard to measure. Still more complex and still harder to evaluate

^{*} A review of the literature about sociometric methods can be found in Frankel and Potashin.¹²¹

is the vitally important inner aspect of behavior which we cannot see. This is the child's inner world which he creates for himself in terms of the meanings and feelings which his experiences produce inside of himself. Until we understand these inner meanings and inner feelings, we cannot truly understand him, nor can we interpret with even reasonable accuracy what he does. More and more we are realizing the deep and significant relationship between the inner world of the child and his outer behavior; we are also gathering substantial evidence that this inner world of thoughts and feelings is closely related to his physical growth and well-being. On the one hand, the nature of his inner emotional harmony or disharmony is affected by his inner physical harmony or disharmony. On the other hand, his physical well-being is affected by his emotional well-being or conflict.

A number of methods have been tried in the attempt to understand and to interpret this inner or private world of childhood.* There are the *nonschematic methods* which, like methods used to study the outer behavior of the child, consist simply of careful observations of free play of children in nursery school or other play groups. Trained observers can often gain valuable clues to inner behavior and feelings in this way. Another method is studying children's spontaneously produced creative products, like paintings, spoken or written stories or models made in clay. As in interpretation of children's free play, only trained observers should attempt to interpret meaning from paintings or other creative products.

In addition to these methods and other nonschematic approaches to the interpretation of children's inner life, there are rapidly increasing devices for studying children under more *systematic and controlled conditions*. Play with selected materials or under standardized conditions often reveals inner thoughts and feelings, since the materials or conditions can be set up so that they stimulate and call out responses in specially selected areas of thought and feeling. For example, a set of dolls which includes a papa doll, a mama doll, a little boy doll and a little girl doll may be given a child when we wish to study his relationship to and hence his feelings about his father, mother, himself and his little

* Two outstanding summaries of these methods and a set of excellent references can be found in Lerner and Murphy,²¹⁵ and in Symonds and Krugman.³⁵⁹ Temple and Amen³⁶³ have an interesting study based on a projective technic.

sister. In his spontaneous dramatic play with these particular dolls he often reveals his true feelings, and sometimes is able to express pent up emotion which has been denied outlet in his family life. Among the technics now in use are play with marionettes or dolls, with housekeeping toys, clay, paints and other creative materials. Another device is to ask the child to name three wishes (or several wishes). Still another device is to start a story for the child, asking him to complete it for you, as for example: "Once there was a little girl who lived with her Mother and her Daddy. She had a little brother. Now you tell me the rest of the story."

These play technics, or *projective technics*, as they are often called, permit the child to project outward some of the thoughts and feelings which he does not reveal in ordinary situations. They have been used extensively in the analysis of children's inner motives and feelings, both in cases where the child is troubled and needs correctional treatment, and as a means of investigating the inner development of normal children. In correctional treatment the play situations have been used not only to reveal the source of the difficulty but also to help the child express pent up emotion and to help him to replace destructive feelings with constructive ones. Where used like this as a treatment device, the procedure is referred to as *play therapy*. When used simply as a means of investigating personality development or emotional reaction, the device is usually referred to as the play technic or as the projective technic.

As we have said, only well-trained observers should attempt to interpret the inner life of children as revealed in play, in creative products or in controlled situations. Even trained specialists need to be warned against the temptation to overgeneralize about the personality of the subject in general from the application of a single projective technic.* All projective methods should be subjected to careful validating studies in order to test their findings against the results of all available descriptions and general information about any child being studied. One session with a child in which one or several projective methods are used is not an adequate basis upon which to draw sweeping conclusions about that child.

The Rorschach Test.—To date one so-called *test* of personality has survived, the Rorschach Test, and is coming into wider use each year. It is actually a method of analyzing personality through

* Macfarlane.²²⁹

careful study of the reactions of the subject to a series of "ink-blot" cards. It has been standardized on adults, but in recent years several workers have been studying the reactions of children to the test and a rapidly increasing literature on the use of the test with children is becoming available.*

TOPICS FOR CLASS DISCUSSION

1. Read Spock, B.: *Avoiding Behavior Problems* (*J. Pediat.*, Vol. 27, No. 4 [October] 1945), or Spock, B.: *Common Sense Book—Baby and Child Care* (Duell, Sloan & Pearce, 1946). Discuss (a) the relationship of early feeding experiences to the child's subsequent emotional development; (b) the relationship of toilet-training procedures and experiences to subsequent achievement of toilet controls, and to subsequent emotional balance.

2. Discuss thumbsucking in babies and young children. (a) Pool the observations of children made by the class members. How many of these children suck (or have sucked) their thumbs? (b) What was the early feeding history of each of these children: length and adequacy of breast feeding? Rigid or flexible schedules of feeding? Age and method of weaning? Completeness of satisfaction of the sucking impulse? (c) What is their history of security in affection? (d) Which of these children have been subjected to the old methods of "habit training," or campaigns to break up the habit? (e) At what age did thumbsucking in each of these children disappear? (f) The general feeling among child development experts is that thumbsucking is a symptom of the fact that some basic need of the child is not being met adequately, and that in sucking his thumb the child is thus meeting this need. This being the case, "campaigns" to keep the thumb out of the mouth only frustrate the child further and can result only in further emotional deprivation. The way to treat thumbsucking, these experts say, is to discover the unfulfilled need and, as nearly as possible, to fulfill it. Do the cases presented in your group corroborate or refute this theory?

3. Review Gesell, A., and Ilg, F. *The Infant and Child in the Culture of Today* (Harper & Brothers, 1943) with the above two questions about routines and their relationship to emotional balance in mind. How do these authors feel about breast feeding as vs. bottle feeding? About self-demand feeding? About sleep routines? About toilet training? About thumbsucking? About social relationships between mother and child?

4. Have someone in the class review Kenyon, J.: *Healthy Babies Are Happy Babies*. (Rev. ed., Little, Brown & Company, 1943) with the same questions (as in 3 above) in mind.

5. Have someone do the same with Aldrich, C. A., and Aldrich, M. M.: *Babies Are Human Beings* (The Macmillan Company, 1943).

6. Have someone do the same with McGraw, M.: *Neuromuscular Maturation of the Human Infant* (Columbia University Press, 1943).

7. Have someone do the same with Ribble, M.: *The Rights of Infants* (Columbia University Press, 1943).

* These have recently appeared in such journals as *Character and Personality*; *American Journal of Orthopsychiatry*; *Rorschach Research Exchange*.

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The Child Grows and Develops Socially and Emotionally

II. PATTERNS OF PERSONALITY DEVELOPMENT

DEVELOPMENT OF AWARENESS OF PEOPLE

The newborn infant has no conception of himself as a person or of other people as different from any of the sense impressions which come to him. When he is hungry or in discomfort, he cries with no thought that a person or persons must come to his relief, but only that eventually he is relieved. Having no realization that he is attended by persons, he has no consideration for the inconvenience he may cause them. He has only the sensations from his own body and the vague conglomerate sensations from the external world

Reactions to People Begin Early.—Strange as it is, he seems to become aware of other people sooner than he becomes aware of himself as a clearly defined entity. One recent study²⁵³ found that most infants react to people as early as the thirty-fifth day by giving passive attention such as looking, making small movements with arms or legs or turning eyes to follow someone. Some children reacted this way much earlier; all children examined reacted this way by three months (see Fig. 56). By a little over two months of age most children were found to react actively to being talked to by the examiner. This active reaction consisted of smiling, cooing, laughing aloud or waving arms and legs in an excited manner. Some children reacted actively in this way as early as twenty to thirty days of age; all children examined did so by three months (see also Fig. 56). When approached quietly by these examiners, the babies were more likely to react passively; when talked to they were more likely to react actively. When actively played with, most of the infants in this study reacted passively by fifty to seventy-five days of age; all of them did so by three months. A

few of them reacted actively as early as twenty to twenty-five days; most of them did so by eighty days; all of them did so by ninety days (see Fig. 57). Most of the children reacted to being played with by a social smile before sixty days of age; and with cooing by seventy days.

Depends upon Social Experience.—This work is corroborated by several other investigators* who find infants of two to three

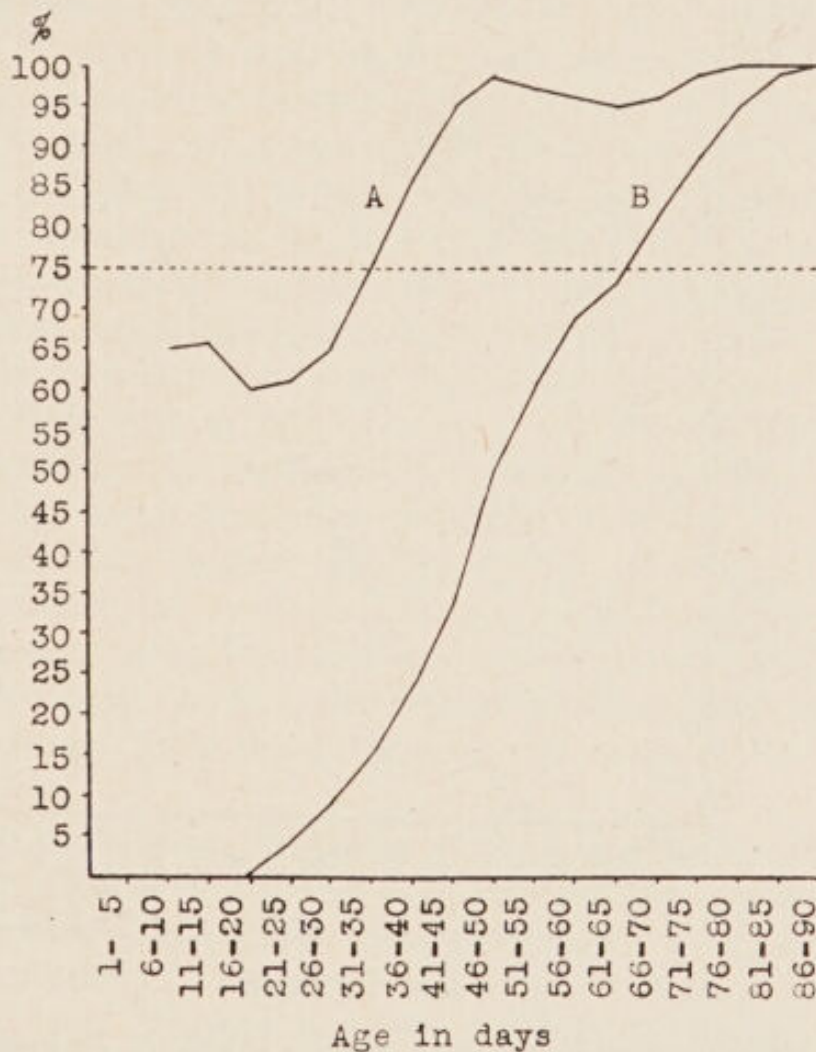


Fig. 56.—Reactions of infant to talking by examiner. A, Passive attention to talking. B, Active attention to talking. (Morgan and Morgan: Adaptive Behavior Patterns in Infants. The Journal of Pediatrics, Vol. 25, 1944, C. V. Mosby Company.)

months of age reacting to being approached socially by smiling in return. No social reaction is likely, however, unless the child is played with and talked to. Left with simple physical care and no social attention or stimulation, the child does not react with social responsiveness at this or at later ages. Social reactivity is highly

* Bühler⁵⁹; Gesell¹³⁶; Jones and Burks.¹⁹⁶

dependent upon social attention and stimulation. In this social stimulation, however, care should always be taken not to over-fatigue or overexcite infants.

By three or four months of age infants have begun to progress from a general reactivity to anyone at all who happens to be near them, and begin the differential reactivity which depends upon

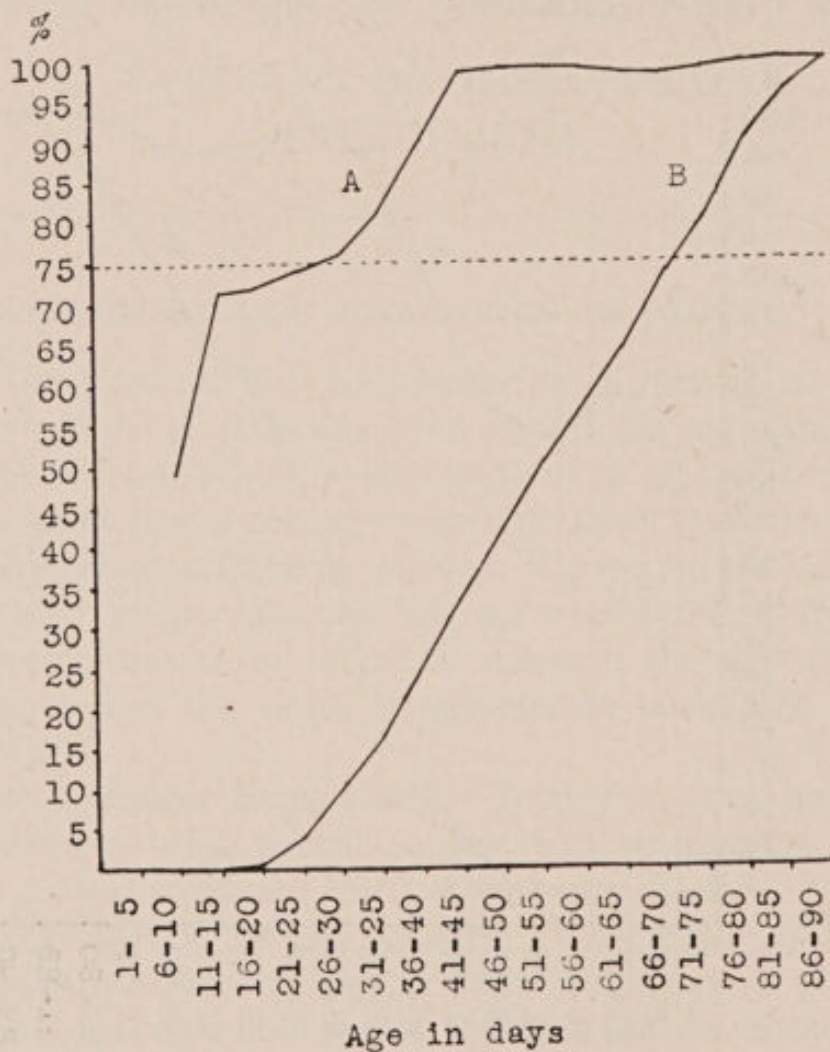


Fig. 57.—Reactions of infant to playing by examiner. A, Passive attention to playing. B, Active attention to playing. (Morgan and Morgan: Adaptive Behavior Patterns in Infants. The Journal of Pediatrics, Vol. 25, 1944, C. V. Mosby Company.)

discrimination between persons. At this time most babies begin to discriminate between one familiar person and another. They give clear evidence that they recognize mother as different, for example, from father. "The rights of a baby to guidance in the evolution of his emotional life must receive predominant emphasis after the fourth month of life. He begins at this time to show, in addition to physical growth and health, the first specific emotional

responses to his mother. His eyes focus for an appreciable time on her face and he smiles in response to her presence, his entire motor system gradually becoming tense with excitement and anticipation."*

Social Initiative.—Recognition of or reaction to other persons when those persons take the social initiative comes a little earlier than does social initiative on the part of the child himself. Once the infant has developed the capacity for social reactivity on the initiative of someone else, he develops the capacity to take the beginning of initiative himself. Often at four or five months the infant will smile a recognition of familiar persons whether those persons have taken the initiative in playing with him or not. By five or six months he shows his resentment at being parted from a familiar person by crying when left by that person. By five or six months most infants withdraw from strangers, and from this time on shyness with strangers may put in an appearance, or it may develop a little later at around nine or ten months. Few children escape a period of active withdrawal from strangers in which they turn, crying, away from the strangers. Whether or not it has occurred sooner, shyness usually occurs at around fifteen to eighteen months, or, perhaps later, and seems to come at a stage of development when the child's awareness of himself has reached a peak. For most children this period of shyness is brief and the eagerness to go out in the world in the carriage and to see people soon returns.

Reaction to People.—"Sociable" behavior develops rapidly from nine or ten months on. By one year many babies if given sufficient previous social experiences have developed a high degree of "social reciprocity"† as compared to babies of three, six or nine months of age. Waving bye-bye, playing pat-a-cake, showing "how tall is baby" by patting his own head are all usual at this time if the child has had a normal amount and a satisfactory kind of social experience. "Give Mamma the ball," or whatever else he happens to have in his hand, will get a reaction of giving at around one year if one reaches toward the child gently and smiles encouragingly. At this time, too, a quick gesture of giving or handing something to other people is a favorite social gesture on the part of the baby himself. However, the object proffered as a gesture of social behavior is more likely than not to be hung on to,

* Ribble²⁹² (p. 83).

† Gesell.¹³³

and a howl will ensue if the adult or another child takes the gesture seriously and tries to part the baby from the proffered toy.

By the time most children are a year old they show definite preferences and dislikes for people. They do not remember people long, however, unless they have had some unusually emotional experience with them. They may as late as eighteen months forget even their mother if she is away for a week or more. Reacquaintance is rapid, however, when she returns.



Fig. 58.—Social play with his mother develops responsiveness to people in this seven-months-old baby.

Infants should see people other than mother or nurse often enough to prevent fear of strangers, but should be protected from persons who insist upon poking, tickling and jogging them. It is not wise to make feeding time or bed time the time for visitors. Eating and going to sleep are serious occupations for infants; there should be no overstimulation or distractions mixed with these activities. Too many children develop the habit of playing and bidding for attention at meals when they are three months old—a habit which causes much friction as they grow older.

Too Much Attention Undesirable.—A child of nine months seems to know when the conversation concerns him. It is certainly unwise to discuss a child in his own presence after he is a year old. Adults should not make a practice of addressing all the conversation to the child or of letting it all center around him whenever they are near him. If they do not avoid this very natural temptation, the child may develop the false idea that all the conversation in the world must be about him, since all the conversation that he hears centers around him. He should learn early that people talk about other things and have other interests, even when he happens to be awake. Lessons which teach a proper sense of proportion about one's own importance in the world cannot be begun too early. There is no more miserable person in the world than the child, who, accustomed to feeling that the world centers around him because all he has ever known of it does, finds himself in a larger world of which he is only a part and usually a most unimportant part.

Social Contact Important from Infancy.—It is important to social development, however, that babies be played with from three or four months of age on, or at the stage when they show reaction to being played with. Some people think that since small babies are, as they say, "mainly in the business of growing physically," they need only be fed, bathed, changed and left to themselves. These people are likely to consider that "personality," as they conceive it, develops at two years or later, the period when "children become interesting as persons." This is quite a wrong conception, and results in a retardation, if not a permanent stunting of the aspect of personality which makes contacts with people successful and interesting.

For example, two children of three years of age can differ widely in their reactivity to people depending upon what their play or social experience has been. John's mother thought that infants had "no personality," and as a result John at twelve months and at twenty-four months certainly did not have any. He had received faithful physical care in early infancy, but no one cooed, patted, talked or played with him as he was being bathed or changed, or when he lay awake. He was left alone throughout infancy. Even at eighteen months one would find him penned into a room with a gate across the door. In the room were his bed, his clothes cabinet, a tattered teddy bear and nothing else. In this sterile environment he was left during his entire waking time. Even at this age, bathing, feeding and toilet activities were dispatched in a business-like and entirely unsociable manner. As a result, John sat dully sucking his thumb or just staring into space, or stood fretfully at the gate whimpering for the attention he never received. There was no attempt at

language until he was nearly three years old; he had no social smile, no eagerness to contact people, no joy in living.

In contrast to this, Bob's mother believed that learning to be happy, resourceful and sociable began early. From the sheer joy of motherhood she patted and talked with Bob from the time she took over his care after coming home from the hospital. As soon as she caught his first social smile, she talked with him again as she was talking when he first smiled, thus beginning in Bob the awareness that it is fun to communicate with people. Some suitable toy, though never more than one or two at first, was always at hand when Bob was awake. His mother stopped by his crib as she went about her work, handing him the rattle he had let drop, rattling the string of wooden beads or otherwise calling his attention to the toy. Thus he learned how to use and to enjoy toys. She talked with him, at first leaning over his crib, then from a greater distance as she worked, so that he could continue his smiling and wriggling reactions, and later could coo or babble in reply. This also added to his sense of nearness to her, and kept him assured that he was not alone. Gradually she increased the length of time she left him alone with his toys, but she seldom failed to speak to him or to throw a gay smile or snatch of song his way whenever she passed near him. Occasionally she changed the toy he was playing with or had dropped because of boredom. Thus she taught him how to be alone with his toys, yet she gave him increasing experience in social relationships. When she had to be away to shop or for relaxation, she left some congenial substitute person near. Thus Bob learned not to be too dependent upon her presence, yet was never left without protection and a friendly presence. This also widened his circle of desirable acquaintances. He was never allowed to become a "demanding baby," who expected adults to respond to his every whim and to furnish amusement at all times.

As a result of all this Bob became a socially delightful child. By the time he was two years old his lively "Hi, Mummy!" "Hi, Daddy!" sent himself and his parents off to a good start in the morning. Climbing into bed with his parents for a two-minute game of "This little pig went to market," or sliding up and down hill on his daddy's upraised knees was welcomed by his parents on even the sleepest mornings because both parents knew the value of such close companionship between parents and child. A firm, "That's all. Now we must get up," brought occasional resistance, but offered opportunity to teach Bob that the world of adults must move on in spite of his wish to keep on playing.

Never aggressive or demanding, Bob greeted most people with a gay grin which won him innumerable friends. His alert interest in the things about him and his wide resourcefulness with even the simplest materials attracted to him the friendship of a wide variety of adults, some of whom knew very little about how to entertain or communicate with a little child but who enjoyed Bob because he made his own contacts with them. For example, on a four-hour automobile trip Bob was never a nuisance because he practiced language while watching "Cows," "Car," "Nother car," "Big truck," "O-o-o waddah" (when passing stream or lake), thus amusing adults as well as himself. When tired of this, he accepted a piece of hard candy wrapped in paper, unwrapped it, sucked the candy for several minutes enjoying its taste and feel in his mouth and then made a game of holding the paper in the breeze, moving it up and down to get variations. This he did for nearly half an hour with a

running fire of comments, "Up," "Down," "O-o-o funny" (when the paper rattled in the breeze). Such a child is a joy to have around.

How much of John's and Bob's personality differences are inborn and how much due to sensible stimulation is subject to question. Undoubtedly the stolid attitude of John's mother was part of her temperament and therefore of John's inheritance, whereas the gaiety and sociableness of Bob's mother was also part of her temperament and of his inheritance. There is a good deal of clinical evidence, however, which indicates that had John been brought up by Bob's mother he would have been considerably more resourceful intellectually and much more likable socially.

Reactions to Other Children Begin Early.—Reactions to other children begin as early as three or four months when one infant may react to others by brief notice, such as a smile at the other baby's wriggings.* By six or seven months infants may show a brief interest in each other and will snatch at each other's toys or poke a finger at each other in a playful gesture. By a year, if they have had previous experience with other children, they will offer each other playthings in the same spirit of social gesturing mentioned above, but will usually hang on or cry if the other infant tries to take possession of the proffered object. Around twenty-one to twenty-four months babies will play briefly with each other (see Solitary and Parallel Play), though it is not until considerably later that they play together in any truly social interchange.

At two years, children are not usually successful in eliciting a desired response from another child.† If given experience with other children, however, the social interchange with them develops rapidly from two to four years of age. At four or five the socially experienced child shows much awareness of and ability to stimulate other children's reactions. They respond to distress in other children, make requests for assistance, take social initiative in "Come on, let's play" and in making definite suggestions as to what to play. In response to other children they utilize varied technics of acceptance, refusal, evasion or changing of the situation.

Development of Relationships to Social Groups.—As we have seen, the infant recognizes another infant in play only by a brief

* Bühler.⁵⁹

† Murphy and associates.²⁶⁰

contact, or by using the other infant as a play object. However, if two or more children are together, after the first novelty of another child wears off the play becomes highly *individualistic*, each child occupying himself with his own activities in almost complete disregard of the other.

From eighteen months to two years the child continues to be absorbed in individual play but is more influenced by the presence of another child. Characteristic play of this age is sometimes referred to as *parallel play*, for each child, although apparently



Fig. 59.—Parallel play. Children play together, yet are absorbed in their own activities.

playing quite by himself, usually plays at the same type of game that occupies the other children of the group. Not only does he play the same game, but he plays at it longer and has more resourceful ideas than he would if playing alone. A favorite game at two years is digging in sand or dirt. One child fills his pail, carries it a short distance and empties it. Another child, who has been digging only, adopts the idea of filling a pail and fills his pail, carries and empties it. There has been no exchange of words, but simply an exchange of ideas.

The Beginnings of Cooperative Play.—The next step to greater socialization may come when the second child conceives the idea

of emptying the pail on the same pile of sand with the first child, thus changing the activity from a purely individualistic emptying of pails into a cooperative building of a mound of sand. This change may take place in silence or may occur after an exchange of words, and may last for several minutes or may relapse into individual activity almost immediately. Sometimes a brief socialization is evident when one child says, "Lets play in the sand," but dissolves when the idea is carried out since each child occupies himself in almost complete disregard of the others.

There is a gradual transition from solitary and parallel play to more cooperative forms of play.* As time goes on and as the child gains experience with other children, there is more exchange of ideas and more cooperation in play. One child says, "Let's play blocks. I'll build a garage." Another child answers, "All right. I'll build mine over here." Again separate projects will be undertaken, but now there is an almost constant recognition of the presence each of the other, and a flow of conversation. "See, mine's big." "Oh, look, I made a roof." Perhaps there will be a temporary merging of projects. "Look out, my car's going to visit your garage."

A little later, for the experienced child at around three to five years of age, the *shifting group* is conspicuous. Under this arrangement a fairly loosely organized game may grow up, lasting throughout a whole morning or even for several days, embracing the activity of a number of children, but depending upon the presence of no particular child. For example, child A may say, "Let's play store." Child B and child C like the idea and join with A to build walls and counters with the blocks. D may appear, watch for a moment, and having learned what is happening, begin to carry blocks. The project is so loosely organized that his appearance causes no confusion, nor is the absence of B felt when he drops away to play for a time with his kiddie car. Child E may join the game, and A and C may go off on some individual project, leaving the store game intact with D and E but with none of the original children. Later B may return. The game goes on with one child or with several, each individual coming or going at will. This type of game is typical when children are getting their first practice at socialized play yet still feel the charm of solitary play in which they can execute their own ideas in their own way. Such semiorganized play is possible in spite of the fact that at about

* Anderson.¹³

this stage of development most children, with growing sureness of their knowledge of the world and with their increasing ability to express themselves in language tend to be bossy and dogmatic in their play with other children.

From this shifting group type of play there finally develops *well-organized group play*. However, during the preschool period these groups are never very complex or stable in their organization. The literature* shows that in day-to-day groups in the preschool period there may be found a semblance of the leadership-follower-



Fig. 60.—A shifting group activity: Children come and go in this game, yet the game goes on.

ship structure of the later organized “gangs.” These relationships are extremely unstable, however, often changing completely in structure in a three-months period. The child who leads today probably will not hold this position three months from now. In some preschool groups the removal of a single member can dissolve whatever group unity exists. In the University of Iowa Preschool Laboratories Parten²⁷² found a trend toward development of leadership throughout the year, with leaders excelling non-

* Reviewed by Murphy et al.²⁶⁰

leaders in intelligence and occupational level of parents, but that individual differences outweighed age differences. She also corroborates the majority of other studies in finding some children able to dominate for a time but unable to retain this status for long. She also found two types of leadership even in the preschool years: the "artful diplomat," and the child who attempts to lead by brute force.

Characteristic Relationships Appear.—Frequently the children who play together soon fall into fairly definite positions within the group as the organization of group play becomes more fixed.



Fig. 61.—The beginning of well-organized play. Here two children are cooperating closely in a project which could not go on without them. They are working as yet without clear-cut leader-follower relationship.

Bühler* refers to these relationships as those of leader, of cooperating companion, tolerated companion or rejected companion.

The *leader* is the child who furnishes most of the accepted ideas and whose wish dominates the play. He proves acceptable to the other children who are willing to follow his lead and who generally rather uncritically admire him. The child who dominates a group through bullying, and hence who rules by fear, cannot be called a leader in any constructive sense.

* Bühler, C., from a lecture given at Merrill-Palmer School.

The *cooperating companions* are those who are always sought by other children, and who stand in a position of cooperation with the leader, often offering him acceptable ideas, and sometimes as the game changes or a special type of leadership is required, stepping temporarily into a position of leadership. These children are usually thoroughly resourceful, and are not afraid to criticize or even to ostracize the leader when occasion arises.

The *tolerated companions*, though seldom sought by the group unless they are needed to "fill in," are occasionally permitted to play even when their services are not particularly needed. They are not usually resourceful and seldom have acceptable ideas to offer. As a rule they are so pleased at being allowed to play that they are willing to play at any post or in any capacity assigned to them by leaders or cooperating companions. When the group or the game changes they sometimes graduate into the positions of cooperating companions but seldom into a position of leadership.

The *rejected companions* are what their name signifies—rejected by the group. Sometimes they really wish to play but have had too little experience to know how. If this is the case they usually soon learn and may become cooperating companions or even leaders. However, they are rejected sometimes because they are entirely lacking in skills and ideas and sometimes because they have been so overprotected or overindulged at home that they cannot mould themselves into an acceptable social pattern. Occasionally such children have a strong enough gregarious impulse to make them conquer even bad home training and to face the discipline necessary for successful social contact. They usually suffer intensely in the process of remoulding their habits, but sometimes succeed remarkably well. A child who is strong enough to bring about such success usually has the qualities which equip him for leadership, and may progress rapidly to that position in the group which once rejected him. A rejected companion whose parents fail to help him realize and conquer the reasons for his rejection is indeed in a sorry position since he will either continue to crave companionship he does not know how to win, or will retreat to the consolation of family protection to spend the rest of his childhood trying to fool himself into believing that he never cared to play. The degree to which he succeeds in fooling himself in this respect often determines the degree to which he is neurotic in later years.

Sympathetic Behavior Appears Early.—Important to social participation of young children is the development of the ability to be aware of and reactive to the feelings of others. Murphy,²⁵⁹ in a study of the development of sympathy in preschool children reviews the fact that the first awareness of the feelings of other children in the group she studied was shown in a tendency to help others when it was convenient or when it did not interfere with the given child's self-absorbed plans. The second stage was marked by a tendency to stop what the child was doing in order to help another child, or to respond to the distress of another. Bridges⁵³ noted marked individual differences among children in this behavior. Some preschool children show sympathy only by staring or crying in sympathetic imitation. A more advanced stage of expression of sympathy is to try to comfort the distressed child by putting an arm around him, or saying "Does it hurt?" or, "What are you crying for?" Only later in social development is sympathy expressed by more active measures to relieve the distressing situation, by such intuitive understanding as is shown by being kind to newcomers and helping them with their new tasks, by offering to share materials, by getting a toy to give to a child or by defending the rights of smaller children. Murphy reports that three-year-olds notice the clothing and routines of other children, which shows a definite advance in social interest beyond the two-year level. In a rudimentary way the social conversation of three-year-olds is adult-like in its inclusion of discussion of clothes, likes and dislikes of people, where one lives and ordinary matters of daily routine.

Murphy further reports that sympathetic behavior in very young children seems to arise from a number of different sources. In one instance it may represent the desire of a child to please a superior member of his group; in another instance it may represent the projection of his own anxiety; again, behavior like fighting, which is usually forbidden by adults, may be permitted because it appears to be in defense of someone else. Sympathetic behavior may also represent a spasmodic spill-over of behavior when one is too frightened to get into the swim, or it may represent genuine warmth and friendliness for the injured child or a desire to be sympathized with oneself. Murphy adds that no form of social behavior can be rightly understood apart from the underlying motive behind it.

In spite of the self-absorption of the preschool child (see

below), which often appears as selfishness and quarrelsomeness, Murphy and Bridges as well as other investigators find that co-operative, sympathetic social behavior is budding in the early years, and with satisfactory social experiences in the preschool years will flower during school age into genuine social insight and human understanding. If one knows how to meet the preschool child on his own level of understanding one will find him lovable, attractive, kind (as far as he can comprehend) and fun to have around.

Generosity Cannot be Expected in Preschool Children.—One needs to remember that young children are self-absorbed because of the many demands which learning makes upon their attention. There are other reasons, too, why children are self-absorbed in the preschool years. Ribble²⁹² says that we must not ask for unselfishness in children at the early stages of social development when the entire ego is centered on self. We should, however, expect the beginnings of sharing at the stage (usually two to four years) when children are widening their interest and ego identifications to include other children. Further steps in generosity can, and should, be expected as the child grows past the preschool stage of small group adjustment and into the stage of more complex group play. It should be recalled also that although young children show many aspects of lively imagination, this imagination has not yet reached the developmental level where true insight into other people's feelings is possible. Time concepts are also extremely limited at this age. When, therefore, we ask a young child to lend his toy to a visiting child "for five minutes," he has no idea that we are not demanding that he give it up for the rest of the day.

Sharing and Social Experiences Should Be Fun.—In order to learn to share, it is important to see that the child gets plenty of satisfactory fun experiences in sharing with both adults and other children. Children should not have social and sharing experiences turned into unnecessarily painful periods when one is constantly nagged to be "nice to your little guest," or to give up precious possessions. Having to stand aside and see one's favorite doll or other cherished possession broken by another child cannot possibly result in the desire to share or even to have other children around. Constant nagging to sit still when visiting another home makes that visit a thing to be avoided in the future. Thus joy in being with people and in sharing one's possessions with them can

be fostered only by having social experiences which produce more fun than pain.

When two or more young children play together, there should be a kiddie car or tricycle or wagon apiece, a doll each or a pail each for digging in the sand. This does not mean that the play space of young children should be cluttered up with excessive equipment, since too much equipment stultifies the development of imagination. It does mean, however, that if there is only one kiddie car or one tricycle between two or more young children, there will be inevitable and constant quarrels over its use. Under such circumstances the aggressive quarrelsomeness can be expected to be most noticeable in the child to whom the tricycle or doll belongs, since the sense of "mine" is acute (see below) at this age. One cannot expect from preschool children anything resembling an adult concept of generosity. When visiting another home the wise mother will take along one or two of the child's favorite play possessions so that he may play happily without being nagged to keep his hands off the knickknacks on the parlor table or to leave his little host's possessions alone.

Children are naturally kind and generous if they are permitted to make gestures of kindness and generosity on their own level. They spontaneously want to see their own joy shared with other beloved adults or children. The point is that the adults and other children must be truly beloved, a relationship which develops if the human relationships are natural, unstrained and fun, yet based upon mutual respect and consideration. A well-disciplined yet well-loved child finds life with adults and other children good. True selfishness of the "mean" variety grows out of an existence in which the child is either badly spoiled by over-indulgent adults, or in which he is forced to grab and fight in order to have a reasonable sense of possession of his own things. Well-loved and well-disciplined children with a reasonable supply of possessions which they can have, yet share, usually develop evidences of generosity fairly early. Bob, described earlier as an exceptionally well-adjusted child, would at two years never accept candy without also asking for a piece for Janet, his four-year-old sister, which, upon request he delivered promptly with evident joy at her pleasure. These two children, left with a neighbor for the afternoon, shared six gumdrops which were given them, laying two on the table "for Mummie." All afternoon there were frequent longing looks at these two pieces, yet the memory of how Mother would be

pleased detained the hands that reached out and were drawn back. This is a rather exceptional example both of generosity and of memory for preschool children, yet shows what can result when social development is at an optimum.

Many Potentialities Present.—It seems in the nature of two-to-four-year-olds to show all types of social behavior, both constructive and friendly, and destructive and selfish. One thing that puzzles many people who do not understand the beginnings of social behavior development and who do not appreciate the intellectual and emotional limitations of young children is that the child seems to display strangely contradictory behavior. Preschool children, for example, fight their best friends more than they fight other children.* This, to the person who understands, is not as contrary as it appears, since the child naturally more often “runs afoul” of the child he sees and plays with most than he does with other children. The children’s natural self-absorption and natural aggressive possessiveness run into each other in proportion as the children are exposed to each other in play.

The inference here is that during the preschool age friendship does not imply to the child any responsibility to inhibit aggressive or antagonistic responses to the behavior of a friend. The learning process seems rather clear. Children of five are only beginning to grasp what is involved in friendship. Their contacts are likely to be exploratory and considerably aggressive. The mastery of the elementary technics of playing with others, the submergence of self-centered concentration on one’s own inner life and its reaction to the outside world, the development of security without which true cooperative group action cannot take place, all these do not come completely in our culture until the child is eight or nine years of age.

It should be recalled here, too, that the quarrels of preschool children, although frequent, are brief, and children recover from them quickly, as a rule harboring no resentment. One study† shows that the average quarrel of a group of preschool children lasted only twenty-three seconds. The younger the child in this study, the more frequently he started quarrels but the less aggressive he was. As the children grew older in the preschool age group, they quarreled less frequently, but were more aggressive when they did quarrel. The majority of the quarrels in this study started with a

* Murphy²⁵⁹; Isaacs.¹⁸¹

† Dawe.⁹⁵

struggle for possessions. Quarrels as a rule led to pushing, striking or other motor activities. Most such quarrels settle themselves without adult interference, although some adult supervision is necessary to keep older and bigger children from bullying younger and smaller children.

Another apparent contradiction in social behavior is revealed in Murphy's²⁵⁹ study. She showed that children who had high scores in sympathetic behavior also showed considerable unsympathetic behavior and frequently had high scores in aggressive behavior. Here again the amount of social contact was high for some children who, in their many contacts had wide opportunity to display the whole repertory of preschool social behavior, both good and bad; whereas less active children simply had fewer contacts. In other words, one can expect all sorts of social behavior from young children who, as a rule, react to each other impulsively and hence who both kiss and strike other children, depending upon the situation.

There seems little sex difference in this, boys showing as frequent sympathetic and friendly behavior as girls; girls striking, shouting and grabbing as frequently as boys. It is not long, however, until our cultural pattern begins to work, and the general expectation that boys must look out for themselves leads to greater tolerance of aggressive behavior for boys; whereas the expectation that girls must be mellow and motherly emphasizes in their behavior the sympathetic and weeds out the aggressive patterns of behavior. Boys who display too much sympathetic and too little fight behavior are likely to be branded as "sissies"; girls who are too aggressive and not tender enough are likely to be called "tom-boys."

The Child Who Has Succeeded in Adjusting to His Peers Has Taken an Important Step in Growth.—As the child meets his contemporaries on an acceptable level, he progresses in the emotional weaning from his family, and builds extensions of his spiritual and social selves. The period from three to five years of age is ordinarily one of rapid development in this respect. It should be a time when the child asserts himself as an individual with at least some degree of success. He should not, of course, become "bossy" and "intolerable" since such traits can only inhibit his growth toward successful social individuality, but he should meet occasional success in his independent strivings if he is to continue in the development of his independent personality. It is fairly usual

for these independent strivings to take the form of boisterousness, of "showing off" and of fighting. Most fathers appreciate the ultimate value of such behavior in their sons and wish to encourage a certain amount of it. But most mothers grieve when it appears, fearing that their sons will never grow up to be "gentlemanly." Both mothers and fathers tend to discourage such behavior as "unladylike" in girls; thus, again, the cultural pattern can be seen exerting its influence. Parents should not, of course, encourage or even tolerate crudeness or rudeness to adults or to children, nor should they permit fundamental disrespect toward adults in any instance. Most mental hygienists, however, consider a certain amount of competition and striving among contemporaries a thoroughly wholesome preparation for desirable aggressive forms of behavior necessary for success and poise in adulthood.*

Shy Children.—Another impact of our American social culture hits hard on the shy child. America places a great premium on the socially "go-getter" type. The result is that most adults become disturbed when preschool children display shyness in social relationships (see p. 403). Nearly all children experience a period of shyness with strangers sometime between nine months and two years of age; some children experiencing it as late as three years of age. Many children are shy also with familiar persons. Some children are deeply, almost oppressively shy.

Shy behavior may change, depending upon the reason for the shyness as well as the treatment the child receives. Nagging a shy child or forcing him seldom results in anything but increased social self-consciousness and awkwardness. If the child already finds it hard to face people socially, he most certainly is not going to be put at ease by having his social reticence made the focus of attention before other people. Patience and quietly giving the child something to do to distract his attention from himself will usually take care of the cases of "growth shyness" or the type of shyness described earlier as an aspect of social growth.

However, shyness is sometimes the result of troublesome inner tensions. Sometimes the child has had a continued social experience in which too much premium was placed upon appearing brilliant or perfect before other people. Or parents may too often have played him up before other people, or too often used the phrase "people won't like you if. . . ." Some children have been

* For further discussion of later social development see Breckenridge and Vincent.⁵²

teased too much by adults lacking in understanding, and have come to dread social contacts. Some children react deeply to emotionally disturbing circumstances like loss of the father who has gone to war, or appearance of a new baby when the child has not been properly prepared to share the mother's attention. Scolding or forcing are disastrous to such children. Only quiet drawing-out combined with an easing of the inner tension can accomplish the desired result.

One such child, Barbara, "ruled the roost" of her home during the first two and one-half years of her life, being coddled, shown off and made the center of attention not only of her parents but of all visitors to the home. At the age of two and one-half she suffered two disasters within three months; her father went into military service, and her mother's attention became deeply absorbed not only in the loss of her husband's companionship but also in the tending of a new baby sister. As the baby sister reached six months of age it became clear that she was a "charmer" socially. Already Barbara, in her emotional bewilderment, had passed through the stage of frantic bids for her mother's attention by toilet relapse, refusal to go to sleep at night and refusal to eat, one device after another being adopted in an effort to focus her mother's attention upon herself, each device being abandoned as it failed to win her mother away from the baby. During this interval Barbara clung pathetically to other people whenever they appeared, climbing on their laps and chattering feverishly to hold their attention. When the baby sister developed power to command the attention of visitors, Barbara began to sulk in dejected silence. The result was inevitable. Mother and visitors noticed and played with the baby more and more and ignored Barbara in proportion. Soon she began to withdraw whenever visitors appeared, and in time she actually hid when they came. Many children at this point, or sooner, would have attacked the baby physically in an uncontrollable desire to dispose of the interloper, or at least to express some of the resentment felt. Barbara, however, at no time did this. Rather, she soon found that she could win a word of approval from her mother by "being nice to the baby," and in time found that the baby's smile eased her loneliness, so she came to spend more and more time in the nursery. It was because of this that no one suspected that the baby's presence might have had anything to do with her increasing withdrawal from other people.

When she began to hide, her behavior came sharply to the mother's attention and it was not long until Barbara's unusual social behavior drew comment from everyone who appeared, and was, unfortunately, talked over thoroughly and frequently in the child's hearing. Pressure began to be exerted to make her speak to visitors. In some children this would in itself have proved a highly satisfactory means of winning the center of the stage. In Barbara it proved to be fuel to the fire of what had already become a consuming feeling of social inadequacy. In time her silence spread to include her mother, and she could be won into conversation with her mother only after several minutes of quiet, unconcerned social sharing, as, for example, reading her a story. In such instances her self-consciousness was forgotten and she would offer comment or ask a question quite naturally.

Luckily the mother loved Barbara deeply and proved to be a thoroughly understanding person in the matter. With sincere thought on the subject and some quiet watching of the child's reactions, she realized much of what had happened. As soon as she could feel that she understood, she did two things. First, whenever visitors arrived she quietly slipped her arm around Barbara and picked up a topic of conversation which would distract the visitor's attention from the fact that the child had not spoken to them. Thus Barbara began to feel less defeated by her social failure, and came to be less afraid that she would be forced to greet people when she could not find it in her power to do so. Second, the mother carefully planned her day to give the child more attention. Barbara, now four, could help her mother in many ways, thus creating a situation of relaxed companionship in which she could talk naturally. With each week the periods when she found it impossible to talk with her mother shortened, and the ease of natural conversation became greater.

The mother also talked with one or two of her most understanding friends who came frequently to the home. These people, accepting Barbara's silence, quietly included her in the conversation from time to time, but always under circumstances which required no answer. In time Barbara began to feel "at home" with these friends and found conversation possible with them. It was over a year, however, before she could muster a social greeting even for these people when they first appeared or when they were leaving. It was two years before this carefully planned program produced ease of first greetings and farewells for most of the familiar persons in the social circle of the family. Barbara by that time had again built inside herself the conviction that, although she did not have the ability to charm people that her little sister possessed, she could at least make the necessary social contacts.

There are one or two relatives and a friend or so who appreciate in Barbara her vivid imagination and her fine physical skills. These people find her as much fun socially as they find the younger sister. From these people she feels her status as a child cherished for something fundamental in herself. This has done much to heal her sense of inadequacy. Fortunately, the mother also appreciates these gifts in the child and is able to love her with a warmth which closes the door to jealousy of the younger child in the family.

Children Overcome Shyness in Different Ways.—Not only do children overcome shyness by returning, through growth, to normal social behavior, they sometimes swing past the normal and into a period of boisterous aggressiveness which can be as troublesome, or more so, than the period of shyness. One of the best studies on shy and aggressive behavior in preschool children* shows that children not only develop shyness for varied reasons, but also overcome shyness in varied ways. Many children, for example, who are solitary and quiet at first become socially at ease partly as the result of growth and partly because of social experience. Other children, whose shyness is more than mere passivity or quietness, are shy as the result of active self-depreci-

* Murphy.²⁵⁹

ation which involves deeper ego feelings or anxiety. These children are likely to recover from their shyness by becoming aggressive, teasing, proud, swashbuckling or domineering. There is also a sturdy type of child who becomes social in his own good time, whose shyness is of the resistant, non-cooperative kind. These children are likely to move from shyness to a marked independence characterized by self-reliance and social cooperativeness. Still other children are shy in a dependent, clinging way, and overcome their shyness by becoming protective, comforting and helpful to others. A final type of shyness is shown in a friendly, imaginative, humorous manner; when these children have overcome their shyness, they often become gay, dramatic leaders. Thus is seen a wide variety of types of shyness with a correspondingly wide variety of methods of overcoming the difficulty, many of the sequelae to shyness proving to be valuable social traits.

The Overaggressive Child.—Some children suffer very little, if at all, from shyness, but are, rather, too aggressive socially. They approach any and all people with cock-sure self-confidence which is often irritating to the person so approached. These children are sometimes so aggressive with things that they are destructive, pulling, smashing, throwing and hauling at objects with vigor. In their approach to people they “rush in where angels fear to tread,” bursting into rooms without waiting to be invited, pelting people with impertinent questions, pushing, grabbing, hitting and bossing other children. Nearly all children have a period of some negativism, as we have seen. Overaggressive children are often stubbornly negative, refusing to bend to discipline or routines, and being unusually insensitive to other people’s feelings.

Occasionally this aggressiveness is a short-lived over-reaction to previous shyness and uncertainty. Sometimes it is the result of spoiling by parents who have let the child believe that he is lovable and irresistible no matter what he does. Sometimes it is the result of deep uncertainty or other emotional anxiety, the child’s aggressiveness being either a cover-up, or a sheer explosion of pent-up feeling.

Like shyness, overaggressiveness takes various forms and works itself out in different ways.* There is the blustering, “show-offy” child, who, with proper growth and experience becomes affectionate and social. Some aggressiveness which appears destructive is only creative ability which has found no satisfactory

* Murphy,²⁵⁹

outlet; once directed into proper channels it becomes the source of creative and original productivity. There is also the type of aggressiveness to be found in the scattered, tense, disorganized child. This, when organized or directed in more peaceful and relaxing channels, may become the source of a fine work drive.

It is clear that neither shyness nor aggressiveness can be properly understood unless one can translate them into terms which will explain what they mean to the individual child who displays them, terms which will reveal the child's inner self, his immediate feelings and persistent needs. What appears to be socially undesirable behavior may prove to be the only available satisfaction in some area important to the child where more constructive satisfactions are not available at the time. In this sense, the undesirable reactions are only distortions of normal ways of behaving. As in any behavior problem, the solution lies in discovering what need the child is endeavoring to fulfill through his behavior, and in helping him to find ways of filling this need which are satisfying to him and acceptable to other people.

Friendship Contacts of Preschool Children.—There have been a number of studies of the friendship contacts of preschool children.* They do not all agree in their findings. Several studies found that chronological age was an important factor in the choice of friends, children tending to gravitate to other children of like age, even in the preschool years. However, propinquity is of great importance, and if children cannot find other children of similar age to play with, they will seek companionship with older or younger children, whichever are available. Under free conditions of choice children tend more and more to seek other children of similar age as they grow older. Young preschool children of two years can trail older ones of four to six or eight years fairly happily, but as the ability to participate socially on a more give and take level develops, the child tends to seek other children of his own developmental level. This shows in several studies in which the children studied offer a wide range of mental ability. Dull children tend to gravitate to younger normal or superior children; more advanced children mentally tend to seek companionship with equal mental rather than chronological age; hence they often play with chronologically older children quite happily and are accepted by them.

* Beaver³⁵; Challman⁷¹; Green¹⁴²; Hagman¹⁵⁵; Hubbard¹⁷⁶; Koch²⁰⁶; Lippitt²²⁵; Loomis²²⁷; Thomas.³⁶⁶

Children of higher accelerated mental development tend to seek more friendships than do average or dull children.* A few studies† show that even in the preschool years girls prefer to play with girls and boys with boys; other studies, however, show that boys and girls play freely together during the preschool years, refusal to play with the opposite sex developing as a rule only at the school age level. No study shows a sex preference in play before the late preschool level, around four years of age.

One study‡ on popularity among preschool children found that among four-year-olds the more popular children were ones who conformed to routine, who showed respect for property rights and tended to ask for commendation. Even those who tended to tattle were more popular than average. On the other hand, children were unpopular who tended to attack, to escape or to offer no resistance when attacked, children who dawdled and who ignored other children. This study reports that sociable children were not necessarily the popular ones. A study§ made at the Iowa Child Welfare Research Station found that children who cooperate with routines were more popular than those who did not, and that physically attractive children were more popular than unattractive ones.

One lead to helping children achieve self-assurance socially comes from a study|| in which it was found that self-assurance tends to increase as children learn skills, both of body control and of language. As children learn how to do things, they become more at ease with themselves as well as with others. This is a corroboration of work done with older children, in which children were found to take leadership positions in groups whenever they had skills or knowledge which other children wished to share. Skills naturally develop with increasing age if children are given reasonable opportunity to learn, but much can be done to help them acquire definite controls over body and language. Children should not, of course, be forced in any learning, so care in developing new skills should be taken to discover capacities in which the child has some interest and can, therefore, develop some degree of skill. It must be understood that self-assured outer behavior

* Beaver³⁵; Hubbard.¹⁷⁶

† Challman⁷¹; Green¹⁴²; Koch²⁰⁶; Hagman.¹⁵⁵

‡ Koch.²⁰⁶

§ Lippitt.²²⁵

|| Emmons.¹⁰⁹

can be achieved only when the child feels inner assurance. He will feel greater assurance as a rule when he becomes more skillful, but he cannot acquire an inner feeling of assurance if he is forced to practice skills which are not easy and natural to him.

DEVELOPING AWARENESS OF SELF

As was said at the beginning of the chapter, children in many ways develop awareness of other people before they develop awareness of themselves. This occurs in spite of the fact that the child spends far more time with himself than he spends with other people. It seems almost that he is too used to himself to be aware of himself. He appears totally unaware of himself as a body or as a person during the first two or three months of life, even though important feelings and attitudes which will later affect his attitude toward himself* are being formed during these months.

However, he can soon be seen in the process of developing self-awareness. At around four months he may be seen lying in his crib in rapt attention as he regards his own hand or foot waving about before his eyes. By six or seven months a look of wonder may go over his face as he pinches his own toes and becomes aware of the resulting sensation as belonging to himself. Gradually he defines his own body as he handles his hands, his feet, his ears, pats his own head on "How tall is baby?" and finds his genitals, which he is likely to handle off and on for a period of several weeks at this stage of his growth.

If a mirror is held before him (see Fig. 62) he will, at around eight or ten months, pat the mirrored image of himself as if it were another baby. As late as a year to fifteen months he may try to crawl around behind the mirror in an attempt to locate the other baby. He may prefer to play with his own mirrored image even though another live baby is present.

Intense Self-centeredness a Stage of Growth.—Even though his development of self-awareness seems to be slow in the first year of his life, the child seems suddenly almost too aware of himself. At around eighteen months to two years "me," "mine," "I want" begin to be outstanding in his language and in his action. He appears to be extremely self-centered and selfish. It is as if he had suddenly discovered himself and had become the focus of his own universe. He demands attention from others; he refuses to share toys with other children; he spends his days either absorbed in

* Ribble.²⁹²

what he is doing or in assuring himself the center of the social stage.

This self-absorption has its roots in growth. As early as six or seven months he is experiencing the intense thrill of conquest over his own body (see Motor Growth) and is so absorbed in his newly-acquired control of eyes, head, arms and hands that he pays slight attention to other people excepting, perhaps, to "play to the galleries"* for a moment at a time. This self-absorption is

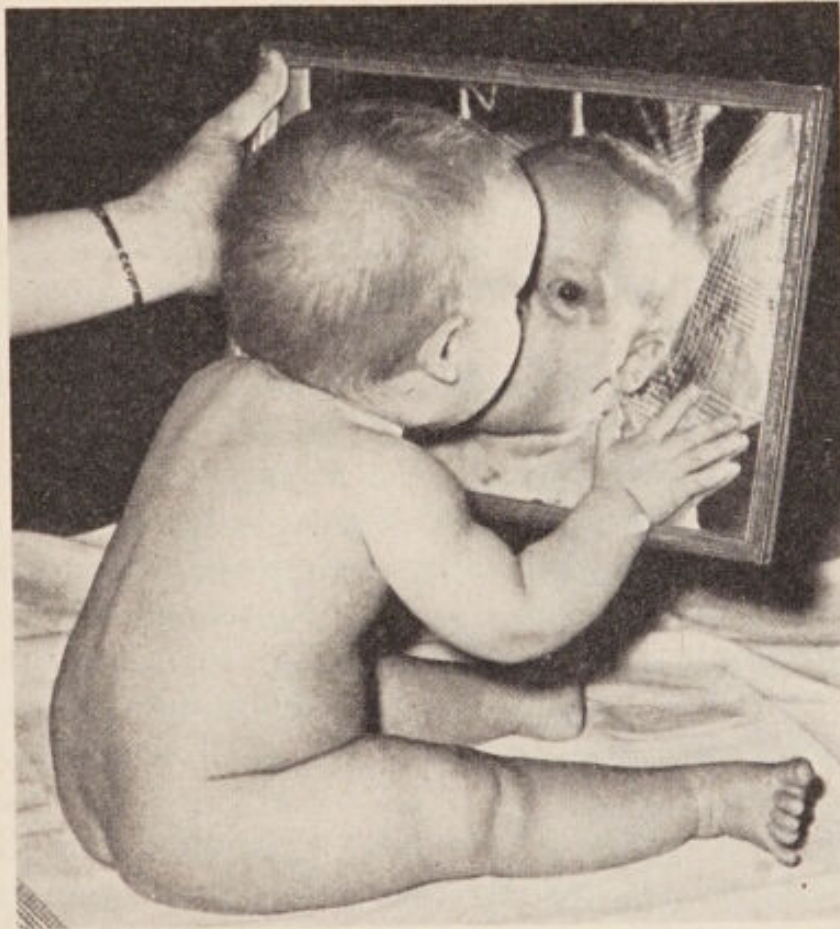


Fig. 62.—In the mirror this baby at nine months does not recognize the other baby as himself.

especially evident at eighteen months to two years, or at the stage of development when the child has achieved upright locomotion and spends prodigious amounts of energy "getting into things," exploring, handling and manipulating everything he can lay his hands on, and seeming almost oblivious to the adult "No, no, don't touch." At this stage the pursuit of his own objective seems stubborn to the adult who tries to side-track or distract him. There is, however, a constructive side to this stubborn self-

* Gesell.¹³³

absorption, since the child, faced with mastering the control of his own body and learning to understand and to speak language, and also with the problems of discriminations of size, shape, weight, color and so on would probably never accomplish the necessary learnings unless he were completely absorbed in these learnings. If he were too reactive to people, he would probably accomplish these motor, language and perceptual learnings much more slowly.

This self-absorption modifies somewhat as the child completes his mastery over elementary motor processes and intellectual learnings, especially in the sense perception area. It persists, in spite of the widening social horizons of the three-year-old, and it is not until four or five years of age that the child begins to clearly sense himself as part of a group. At around three years of age most children begin to use "we," "us" and "ours" instead of the previous "I," "me" and "mine," which at two years pervades their use of pronouns.

At around four and thereafter through age six, boasting is a dominant form of play and conversation. It is at this stage that the expanding sense of self leads to the persistent "look at me, see me," and to the exaggerations which seem to be lies but are really attempts to have more and be more than the other children. It also leads to an urge to widen physical horizons, to break out of bounds, both physical and psychological, so that unless the adults in charge expand the play space and take children of this age on walks for exploring purposes, running away from the yard is likely to occur.

In this development of self the child often relives his babyhood at around two and one-half to three years of age, and may even express a desire to be a baby again. Many parents wisely meet this stage by responding to the child's "Let's play I'm a baby"; they feed him if he desires, rock him on their laps and pick him up and carry him as if he were tiny again. In doing this it is just as well to regard the activity as a game, thus working on the assumption that although this is fun we are really growing up and that is even more fun. Not infrequently this stage develops at the time a new baby has been added to the household, and bears some of the elements of a desire to return to babyhood in order to command Mother's attention once more. However, it occurs in only children, and seems to express some aspect, as yet not quite understood, of the developing awareness of self.

Early Expansions of Self.—As the self develops it expands beyond oneself, so that the child learns to identify himself with his possessions. At around eighteen months children as a rule become closely attached (identified with) some such possession as a soft doll or toy animal. They pet, hug and kiss the object, and are inseparable from it, clutching it with one hand while eating, insisting upon taking it to bed with them. As play interests develop the daytime attachment to these objects becomes less intense, but many children insist upon taking such a beloved toy to bed with them even when they are eight to ten or twelve years old. Boys are particularly prone to do this. One explanation may be that in our culture girls are permitted and encouraged to play with and caress dolls, whereas boys are forbidden to do so. Therefore girls can “work off” this need to identify themselves with something outside of themselves in open daylight, whereas boys have to “work it off” at night when no one, especially the gang, is looking.

In any case, this ability to love something besides oneself intensely is a step in the widening of the self which is basic to any capacity to love anything or anybody beyond oneself. It should be encouraged in children rather than made fun of or forbidden.

Development of Ability to Love Someone Else.—All emotions are capable of increasing socialization. As the personality develops the child must learn to live with each of his emotions so that he will become less self-centered and more social-centered. Fear, anger, jealousy and love must all grow into socially acceptable emotions if he is to live fully and to be adjusted satisfactorily in adult life. The ability to love constructively is in many senses simply the capacity to constructively identify oneself with other people. Let us consider the usual steps by which this development occurs.

The newborn infant, as we have seen, loves no one except in a most self-centered sense. He feels his own world of sensations; he finds comfort when cared for, but he has no respect for the comfort or well-being of others. This is to be expected from tiny infants. As time goes on, however, this self-centered being should have such experiences as will help him to acquire an ability to consider others, to feel sympathetic identification with them, to be happy at their happiness or sad at their sadness and to be willing to inconvenience himself in order to promote their happiness and well-being. This involves two types of development of love:

one in which the individual becomes a good citizen, a good community or society member; and the other in which he becomes a good family member. In the latter adjustment, he identifies himself and his own interests much more intimately with others than in the former adjustment. The process of the former wider adjustment to others has been discussed earlier in this chapter. Here, we are concerned with the capacity to love on a more intimate basis. There is, here, the development of the capacity to love on a deeply emotional level, to feel closely and to respond fully to the feelings of the people who compose a family group, to understand, tolerate and share and to express and receive the physical aspects of intimate love.

The Psychoanalytic Viewpoint.—Probably the best explanation of the way this development occurs and the conditions conducive to its growth is to be found in psychoanalytical writings.* This school of thinking emphasizes the importance of the young infant's relationship to his mother, the importance later of the child's attachment to the father, the importance of early childhood manifestations of the sexual impulses and the need to deal with these wisely and wholesomely. They point out the many cases of adult neuroticism which can be traced to inadequate relationships between mother and young child or father and young child. They urge attention to the extreme importance of adequate, frank and wholesome sex education.

Patterns of Love Development.†—As the child's self and his ability to identify himself with others develops, certain patterns can be seen through which nearly all children grow. At first, for both boys and girls a close attachment to the mother is characteristic in infancy. She is the source of food and comfort. First love goes to her. Wise fathers share in the physical care and social play with their babies so that they may have a share in this first capacity to love.

Gradually the child should learn to include others besides his mother in the circle of his expanding affections. If the father is at all skillful in his care and play, he is usually included next, even though he may not spend a great deal of time with the baby. At around eighteen months to three years girls are likely to attach themselves closely to the father emotionally, sometimes refusing

* Freud¹²²; Ribble²⁹²; Isaacs¹⁸¹; Horney.¹⁷³

† Patterns of development of fear, anger, jealousy, sympathy and other emotions are discussed in: Jersild^{188, 189} and in Murphy.²⁵⁹

to let the mother do anything for them if the father is around. During the war when separation from the father became necessary, it was girls of this age who showed fairly serious emotional disturbances more frequently than did girls of the younger or of the older age groups. Boys identify themselves with the father, as a rule, at a little later age, their attachment being at a peak around four to five years of age. Again, in the war separations, it was boys of this age group who appeared to suffer most from the loss of the father.

As the child enters school he develops a more casual, less dependent attitude toward his parents, yet is likely still to cling to the intimate moments at bed time or at other times when comfort and assurance are needed. In adolescence there is again a period of shift of the child's most intense love. At this time the girl becomes closely attached to her father, often being negative and antagonistic toward her mother; whereas the boy becomes almost romantically attached to his mother and may show rebellion against his father.* Parents must accept the fact that the child's love will shift its central focus from one to the other parent, and that, although its focus normally remains in the home throughout the school years, the child will often appear during these years to have his central interest elsewhere. Jealous competition between parents for the love of a child results inevitably in warping of the child's normal love growth and may result in the disaster of inability to marry happily.

Ability to Express Affection.†—The ability to express affection toward the right people at the right time and in the right way is of great importance to normal and happy personal living. Inability to handle this aspect of personality adjustment often results in sexual disaster in adolescence and adulthood. Let us review the usual stages through which physical expression of affection normally develops.

In the newborn infant the love emotion is aroused by physical caress, a stroking of the skin or patting of certain specific areas. Around a year to eighteen months it is roused by ministrations to the physical needs of the child. Expression of love at this level usually consists of return caresses, of cajoling smiles and of de-

* For a fuller development of this and the reasons for it, see Breckenridge and Vincent,⁵² Chapter XIV.

† For further discussion of development of sex and the need for sex education see Breckenridge and Vincent.⁵²

mands for attention. Sometimes an individual never grows beyond this stage, but always remains in the state of love infantilism in which he devotes his entire love energy to physical caress and his entire love loyalty to the person or persons who wait on him, give him his own way and protect him from all unpleasantness. Such individuals occasionally find mates who will meet them on the parent or nurse basis, but even so, marriage is seldom successful for them, since expression of love on this level is too demanding and too selfish to permit happiness.

Various Childhood Experiences Contribute to This Development.—As the individual develops in love he should learn to be stimulated by ideas and interests as well as by caresses, and by the spirit and personality of another person as well as by his physical attractiveness. He begins to learn something of this if he is given an opportunity to know his parents in the role of persons as well as of “doting” caretakers, if he can meet and learn to love other children even though they, like himself, have selfish interests and refuse to sacrifice themselves to his whims. Love in the gang is often roused by a situation which permits the child to “show-off” before an audience, or which permits him because of the “gang” or of the cooperation of particular members within the gang to achieve his own desires. Often he learns to use individuals or groups as a background for his own activities and as a means for accomplishing his own selfish purposes. He is likely to yield his own desires only as far as is necessary to win and keep his place in the group. His expression of love at this age is usually a blustering defense of his “gang,” or an occasional self-conscious attempt to serve one of its members. In the “gang” he receives a fairly severe discipline in expression of the love emotion, since he soon finds that physical caresses given to a “pal” or to members of his family in the presence of the “gang” meet with scorn. He must grow beyond the baby timidity which tempts him to cling to his mother’s skirt or to cry when he is bewildered or displeased, if he is to be acceptable to his contemporaries. Fortunately, his urge to meet the demands of his group is usually strong enough to motivate the necessary self-control.

Sometimes the Development Is Not Completed.—There are some people who never grow in love beyond the confines of their own families. When this occurs the social and emotional weaning has been incomplete. Such persons can never learn to love anyone who indulges them or “understands” them less completely than

their families do. Nor can they conquer the tendency to run back to the protective atmosphere where childish weeping and infantile clinging dependence are tolerated. Some individuals pass beyond the family boundary into the gang stage, but never go beyond that. If so, they continue to demand the applause of a specific group, to depend for stimulation and motivation upon the "exclusive feeling" of secret societies or club life. They are ever ready to furnish ideas but seldom willing to make a real sacrifice to carry them out. The patient and continued love and understanding of individuals without which close friendship is impossible is beyond them. One hears these persons referred to as "the life of the party," yet usually finds them miserable and without resource when alone or when dependent upon one or two people.

Adolescent Experiences Also Have a Contribution to Make.—Early adolescent friendships teach that kindness and service are the *sine qua non* of mature love, since in maturity one loves most the person for whom one willingly gives most. Adolescent friendships are often founded on the basis of admiration for accomplishment, brilliance, richness of ideas or for soundness and beauty of personality. They should teach the individual to love mind and soul as well as body, to rejoice in the sharing of interests and ideas as well as of physical caresses. They should serve to stimulate expression of love in improved accomplishment, broader service and richer development of the personality. They can, in fact, be considered sound and wholesome in proportion as they expand interests and enrich personality, and may be condemned as unwholesome in proportion as they limit interests and dwarf personality growth.

Many persons grow this far in love, developing a mature reaction to spiritual and social stimuli, accomplishing an almost completely socialized expression of love in service to society, but cannot bring themselves to the final achievement of the biological goal of social growth as expressed in the choosing of a mate and the establishing of a new family.

GENERAL EMOTIONAL CONTROLS

In the development of the love impulse we have seen that there is involved in this, as in the development of all emotions, a two-fold process. In one process the child grows in his increasing discrimination about what should arouse emotion. In the case of the love impulse, he graduates from being able to love only persons

who wait on him to the ability to love on a more grown-up basis. In the second process the child learns how to express emotion less in selfish and uncontrolled ways and more in socialized and acceptable ways. In the love emotion he graduates from simple acceptance of service with a coo and a smile to the ability to wish to serve others as an expression of his love. Let us look at some general patterns through which the child's total emotional capacity develops.

Earliest Emotion Is Nonspecific.—The newborn infant is capable of emotional response apparently so complicated in its mechanism that it calls into play almost every part of the body. Just what rouses his emotions and just what emotion he shows as the result of specific stimuli is a matter of dispute. But that he becomes roused to emotion by remarkably few types of stimuli and that the number of his emotional reactions is limited seems to be agreed upon by recent writers. We see, then, that the emotional behavior of infants is limited; it is roused by probably not more than four or five distinct stimuli; it becomes varied in kind and amount depending upon the experience of the child; and that early emotional experiences may make deep impressions which last into adult life, molding adult ideas and behavior. Whether or not the final emotional pattern of adult life is set by the age of two years, as some writers maintain, is a point of dispute. That it is set to an important degree by the age of seven is unquestioned by most writers in education and psychology. Gesell¹³⁶ assures us that "the early impression of the family life during the first five years leaves the most fundamental and enduring imprint." Many writers feel that the pattern of emotional behavior cannot be changed after adolescence, although the most astute observers of human behavior know that it can be changed at any age if the individual is willing to make the effort. The point is that after adolescence the effort required to change emotional behavior is tremendous—almost superhuman—and few people ever become sufficiently interested to attempt it.

Physical Care Important in Early Emotional Development.—One important factor in the development of the child's emotion is his physical care. If his life is smooth, with intelligent management of feeding, sleeping and elimination, he experiences a sense of well-being which is conducive to the free flow of his emotional life. Poor physical care thwarts the child's inner needs and results in accumulation of inner emotional tensions. Sick children who, even

with the best of care, cannot utilize food well suffer emotional frustration of the first order. It is especially necessary to see that these children are left to cry as little as possible and that they have a maximum of physical love and comfort to compensate for the inner pain and tension which unsatisfied hunger produces. The whole pattern of disposition may thus be bent toward fretful dissatisfaction with life or toward contented acceptance of it in the first year or so. Accumulation of inner frustration and tension may set a habit of nervous tension for years to come, whereas a relaxed inner contentment in the earliest years may set for life a pattern of relaxed and efficient reaction to each day as it comes. Adequate relief of physical tensions thus becomes an important part of normal and adequate emotional development.

Parental Love Also Basic.—As has been emphasized earlier, parental love, expressed in terms which no child can doubt, is also of paramount importance in setting an early pattern of relaxed, contented ease in the management of daily living. All the other factors discussed in this book have a contribution to make to the background of normal development of emotions. Children, normally, given reasonably adequate physical and psychological care, develop a happy disposition. Morgan,²⁵¹ in a careful study of one unusually vigorous, superior baby boy of eight months of age, concludes that “the normal continuing condition of a sound, healthy infant is one of emotional neutrality, that periods of happiness are departures from this normal state, due to desirable stimuli, and that periods of unhappiness are similar departures caused by undesirable stimuli, or by the removal of desirable stimuli.” There seemed in this study to be no necessary alternation or rhythm between happiness and unhappiness. Although the author does not claim his findings to be indisputable fact, but, rather asks earnestly for further study in this area, the findings are thought-provoking. This study offers experimental proof of the theory well known to clinical workers and explained above, namely, that children’s dispositions can be steered into happiness and contentment. It corroborates the work of Ribble²⁹² who urges complete emotional security and happiness in the early months of life, with discipline being administered only when the child’s mental functions are sufficiently developed (at four months and later) to make learning from discipline possible.

The General Pattern of Emotional Development.—In infancy, emotion is expressed vigorously and primitively. When unhappy

or frightened, a young infant cries, clutches and struggles physically. When he is happy, he relaxes contentedly, or a little later coos and laughs to express his joy. He is roused by physical things, being unresponsive to psychological situations because he cannot yet comprehend them. As he becomes able to react to psychological as well as to physical stimuli, he gradually learns to react less to immediate and physical stimuli, and to be more responsive to social and other psychological stimuli, as well as to remote or long-time stimuli. He also learns to control his expression of emotion, crying less easily, holding his temper, combating fear with growing courage and directing joy and eagerness into constructive work.

These controls come gradually, however. Most preschool children have made beginnings only in the process of growing up emotionally. Three-year-olds, for example, are normally quite emotional in their reactions to life, being made glad or sad or angry by slight happenings, and expressing these emotions obviously and openly. Murphy²⁵⁸ explains this as follows: "By and large it pays to be suspicious of a 'matter-of-fact' three-year-old. The age of three is a time when a child has a right to have emotions—he has only recently acquired his sea-legs, language is still being acquired with startling rapidity, new discoveries in the world are being made daily. The child who goes through all this without due emotion is missing as much as the person who marries without love. Few three-year-olds have a right to be unemotional; when they are completely matter-of-fact, it is worth asking whether this isn't a specious and external 'adjustment.'" Yet, even at three years the processes of self-control should have begun. In most children of this age toilet training is complete or at least in the unstable stage (see p. 438); ability to wait to eat when hungry has been educated to three meals and two or three snacks a day; crying over trivial hurts has been overcome; and other beginnings in emotional control have been made.

Reaction to Emotional Difficulty.—When young children experience emotional difficulties they may show physical symptoms of loss of appetite, wakefulness, irritability or restlessness. Nightmares in children of all ages should call for an investigation of the child's emotional well-being. Many children release their emotional difficulties in imaginative play* through which they can get rid of tensions arising out of stress or of anxiety. Some children

* Levy.²¹⁶

release accumulated emotional tensions in explosions of temper or fear or even in destructive play. Such behavior should not be punished; it should be understood as a symptom and should be studied to find out what the child is trying to say through such behavior.* Play technics and play therapy (see Chapter X) are useful here. The remedy for such explosive or such retreat behavior is to find the cause and remove it if possible. Meanwhile, when the cause is not yet found, or, if found, cannot be removed, the child should be given every possible emotional security and all the emotionally constructive experiences (of joy, rest and peace) possible.

How love and understanding, which give the child affectional security and personal status, can restore children who have suffered from the lack of it was proved in one study by Murphy who made case studies of 150 preschool children over a period of years. She concluded that under conditions of understanding and love, behavior problems due to the lack of security and status disappear. She says: "Similarly, specific aspects of behavior such as lack of coordination, thumb-sucking and enuresis [incontinence of urine] disappear without any direct treatment at all. No verbal suggestions, habit-training efforts or disciplinary measures were involved in a number of cases where these patterns were dropped. They can often be seen as adaptive reactions of an insecure or frustrated child which yielded to socially acceptable patterns when his relation to the social group became a happy and released one." †

Other Causes of Behavior Problems.—Thwarting of emotions or inner anxiety are not the only causes of behavior problems in young children. Gesell states the case for the type of behavior problem which occurs as a result of sheer growth, the type which appears at certain stages of growth in most children as a result either of an inner disequilibrium in growth or as a result of some error we in our present culture are making in what we expect of children. Gesell and Ilg say: "A developmental approach is of supreme importance in the management of those variations of conduct which are sufficiently atypical or pronounced to deserve the designation of behavior deviations. In infancy and early childhood it is especially difficult to draw a sharp line between normal and abnormal behavior. In a sense all children are problem chil-

* Erikson.¹¹⁰

† Murphy²⁵⁸ (p. 406).

dren, because none can escape the universal problem of development which always presents some difficulties. On the other hand, there are few forms of malbehavior which are not in history and essence a variation or deflection of normal mechanisms. . . . Many behavior deviations have their inception at a specific age when a mild degree of manifestation is well nigh universal. The deviation is in the nature of an exaggeration, or an 'over-individuation.' Over-individuation means that in a period of normal disequilibrium the behavior did not become duly subordinated to the total action system; it grew out of proportion."*

Whether or not thumbsucking, or stuttering is serious must be judged by their relation to the developmental pattern. In our culture most children suck thumbs for longer or shorter periods. In our culture also, transient speech defects such as stuttering often make their appearance at the stage of development when the child has more urge to say things than he has words with which to express himself. Such stuttering represents a disequilibrium in growth which occurs in the majority of children at about two and one-half to three years of age.

For children from one to three years of age, or at the period when routines are being established, even so-called stable children can be thrown off balance by a simple interruption in routine like a visit from Grandma or having to take a nap at an unaccustomed hour. The mother who understands these periods of disequilibrium and the forms the child's behavior deviation may take at the various periods is spared much anxiety. Growth has a strong impetus, so that the child can be expected to pull through these periods of disequilibrium by sheer inner or inherent sense of direction which works in line with his own unique pattern of development. The better we understand this fact of child development, the more we are inclined to trust inner development and the less we are given to the old methods of pouncing upon the so-called behavior problems with vigorously enforced campaigns of correction.

However, whenever a behavior problem is prolonged or whenever it is severe, one should always bear in mind that such a behavior problem is probably due to more than a temporary disequilibrium in growth. For example, many six to eighteen-months-old children rock themselves in bed. One should not be too disturbed when this occurs. Some writers recommend rocking such children to sleep in order to satisfy the desire to be rocked. How-

* Gesell and Ilg¹³⁶ (p. 295).

ever, some children indulge in strenuous body rocking to the point of physical exhaustion, or in severe head bumping. These are not to be regarded as common aspects of growth in our culture but should, rather, be understood as an evidence of inner tension. Most children suck thumbs for longer or shorter periods of time, as has been said, but thumbsucking which absorbs the child's attention all day in competition with normal play interest should be taken to mean that the child is in need of some change in routine or of personal relationships. Most children have some difficulty in learning to keep a bed dry, but some children have still not learned this by four years of age, boys characteristically having more difficulty with this learning than girls. When the learning is as slow as this, one may assume that something in the physical or psychological well-being of the child needs attention.*

Temper tantrums and negativism are almost universal in children of nine months to three years, the peak being for most children around two to three years. They occur when the child is having difficulty in judging accurately the properties of objects (see Sense Perception), when manual skills are as yet unequal to the things the child wants to do with his hands and when his recently acquired upright locomotion gets him into everything in the house with the consequent constant "no" from the people around him. For these reasons most preschool temper tantrums are "growth phenomena." Normally the negativism and temper taper off after the child has gained reasonable mastery over his body and his surroundings (around three and a half to four years for most children). However, some children show prolonged and violent temper tantrums which are more intense than those of most children and which do not taper off as normal growth occurs. These should be regarded, not as normal growth behavior, but as symptoms of an inner disturbance which requires attention.†

One excellent study‡ of 555 nursery school children may give some help in knowing what to expect as normal or growth behavior problems in preschool children, since each item on the list occurred in from 50 to 90 per cent of the children studied even though they all had the benefit of good nursery school environ-

* For further discussion of these points see: Spock^{340a}; Spock and Huschber³⁴¹; also Tomkins et al.³⁷⁰

† For an excellent discussion of temper in young children see Benjamin.³⁸

‡ Hattwick and Sanders.¹⁶²

ments. The list of undesirable behavior found in this high proportion of children follows:

UNDESIRABLE BEHAVIOR IN NURSERY SCHOOL CHILDREN

Per Cent of Children

<i>Showing the Trait</i>	<i>Trait</i>	<i>Peak</i>
80.....	Ask unnecessary help	2½-3 yrs.
85.....	Leave tasks incomplete	2-3½ yrs.
90.....	Waste time at routines	2-4 yrs.
80.....	Ignore requests	2½-3 yrs.
85.....	Dawdle at meals	2½-3½ yrs.
75.....	Wriggle a great deal while sitting	2½-3½ yrs.
60.....	Resist at rest	2-4 yrs.
50.....	Fear strange people or objects	2-3½ yrs.
70.....	Laugh, squeal, jump around	2-4 yrs. (consistent)
70.....	Slur or speak indistinctly	2-2½ yrs.

Twenty per cent or more of the children studied showed habitual tendencies towards all of these undesirable traits. Children of two years of age exhibit many tendencies which, in the normal course of events, tend to decrease gradually and regularly throughout the preschool period. The authors conclude by saying that preschool children are necessarily dependent on adults, have inadequate motor control and short attention span, are very active, negativistic, and self-centered. These characteristics cause the traits listed above.

The Unstable Period of Learnings.—Many of the less desirable emotional manifestations of preschool children characterize later periods of children's lives as well. They occur, apparently, whenever the child is learning many new things at one time so that his psychological energy is being diverted into a number of channels at once. In the two-year-old, for example, we have already pointed out that tantrums and distractability are the products of the many thwartings which occur when the run-about child gets into and handles more things than he as yet has skill to handle properly. He, therefore, often hurts himself, or is angered when he cannot adjust to some object, the properties of which he has not judged correctly. In addition to this he is forbidden so many activities by surrounding adults that he is constantly irritated by this additional factor. Underneath all this is his compelling urge to grow, and to explore and widen his experience; his ego is developing rapidly. This produces repeated thwartings. Tantrums are a natural result.

One must remember, too, that all new activities or learnings are fatiguing. Recall how tired you became when you were learning

to ride a bicycle or to skate, at the stage where you could almost perform smoothly but still had to concentrate tensely in order to accomplish the result. Two-year-olds are in this stage of learning in walking and running, in talking, in adjustment to daily routines and in adaptation to people. They seem to be making remarkable strides in growth, and they actually are. But great fatigue results from the intense concentration still required by each bit of exercise of the learning, which is as yet unstable. Emotional by-products such as leaving tasks unfinished, wriggling, dawdling and so on are natural under these circumstances.

It is characteristic of learning that it reaches an apparently smooth, finished result on the surface before it has been practiced in the nervous system long enough to make it truly automatic. This unstable stage which is inherent in most, if not all types of learning, is likely to come to light whenever the child is asked to make a new adjustment before given learnings are fixed. For example, children who seem to be trained for the toilet so that they no longer have accidents demonstrate this principle when they "relapse" if a baby is born into the family, or if they are entered in nursery school or if some other basic and demanding adjustment is required of them.

It is true that such relapses sometimes occur after the learning has had several months to crystallize. In such cases the relapse is a real step back. We are here concerned, however, with the so-called relapse which occurs when the child is exposed to new demands shortly after a skill or learning has first appeared to be accomplished. This is not a true relapse, but is, rather the evidence of a partially fixed learning which has been "jarred loose" by an added distraction or pressure made upon it. What really seems to happen is that the child, in the unstable phase of what appears on the surface to be an accomplished learning, is able to accomplish the task (for example, of remaining dry) only when he can give the matter considerable conscious attention. When, however, serious distraction of attention occurs he cannot concentrate hard enough to accomplish the task in hand. Since the patterns in the nervous system are not yet sufficiently fixed to function automatically without conscious attention, they do not function smoothly. What looks like a relapse, but under these circumstances is not, occurs.

Bill, age two and one-half, had been dry nights for two months when he entered nursery school (for most children the unstable period of toilet training

is several months). He had been eating easily, largely feeding himself, for three months. He was learning to play with the neighborhood children without too many quarrels. Upon nursery school entrance he seemed to make a perfect adjustment, fitting the routine nicely, playing happily by himself, or watching the other children. He ate well and slept well at nap time. Yet at home, beginning with the first night of nursery school attendance, he wet his bed every night for a week, tapered off for the next two weeks and was again consistently dry only after three weeks had passed. Although he ate well at school he fussed over meals and refused to feed himself at home. Readjustment here took about four weeks. He fussed and quarreled with the neighborhood children for about one week, after which there was rapid improvement in his adjustment to them. His mother was wise enough to know that in these so-called relapses in Bill's behavior she had in reality only a temporary cracking up of learnings which were still in the unstable state. Had she regarded them as true relapses and set up a "campaign" of correction, she might very well have set up tensions within Bill and conflict between herself and him which would have long extended the undesirable behavior. As it was, she had the good judgment to wait for Bill to make his inner adjustment to the new experience.

The difference in approach to behavior problems implied here is important. When the problem is simply an aspect of growth or is a breakdown of a learning still in the unstable stage, the approach should be one of giving natural growth an opportunity to correct the difficulty. When, however, the behavior problem is due to inner tensions or anxieties, to physical difficulties or maladjustment in some other area, the approach is one of correction or therapeutic treatment. It has been our experience that a high proportion of preschool children's behavior problems are of the former sort.

The Integrated Stage of Learnings.—Each learning probably has this unstable stage, when strain will break up the as yet not quite automatically fixed pattern. When, however, the pattern has had sufficient practice for it to function automatically, conscious attention to it is no longer required. Psychological energy is then released to undertake new learnings or to produce a relaxed period of enjoyment of previous learnings.

In our culture, with the demands we characteristically make upon young children, there appears to be a period at around eighteen months to three years of age when several basic learnings are in the unstable stage. At around three years, or if not at this chronological age then at the stage of learning which most children reach at around this age, there seems to be a period in which fewer learnings are being newly mastered. At this time earlier

learnings are accomplished, and a total integration of previous learnings seems to occur. This is in many senses a "breathing spell" for the child, and, needless to say, for the mother as well.

At around four years another set of new learnings begins to accelerate rapidly. These learnings concern adjustments to people, the development of imagination, a new spurt in language and other factors which concern the child's general adjustment to a wider world than his previously limited one. There are, of course, certain by-products of the instabilities in these new patterns. Misrepresentation of facts, an abundance of fanciful as well as real stories, quarrels and social blunders with other children and impudence to adults all characterize this period. However, with practice and experience these learnings, too, eventually become integrated, and the child becomes easier to live with again.

Entrance to kindergarten, and again to the first grade, demands a great deal of attention and emotional energy. Any learnings which happen to be in the unstable state at that time are likely to go through some disruption. Some children are better prepared for this experience than others, having learned to adjust to some authorities besides the mother, having accepted major routines and having made some adjustment to other children. For these children entrance to school is not as demanding. A few such children will slip into the new situation with slight, if any, unhappy events in adjustment. Most children require several weeks to settle "into the groove." A few children take three or four years to make a smooth adjustment to school life. Few normal, well-cared-for children require longer than the fifth grade.

Progressive Unstable and Integrated Steps in Learning.—Many of the most basic of human learnings have long delayed 100 per cent maturity levels. The more complex the learning, the longer the ultimate integration stage is delayed. Such learnings would be the learning of social responsibility, the proper use of money, continued improvement in the use of language, the constant refinement of self-controls and so on. In such learnings it would appear that the human being progresses a step at a time, each step having its stage of instability followed by crystallization into automatic, integrated smoothness.

For example, one step in social responsibility is to learn not to make whimsical demands upon other people. The baby learns not to fuss too much when he needs attention and to adapt his hunger and his sleepiness to routines which fit into the larger routines

of the family as a whole. A little later he learns to feed himself, still later to dress and undress himself and to take complete toilet responsibility, thus relieving his mother of much of his care. Along the way he makes a beginning toward doing his share in the running of the family machinery. He may pick up the newspapers in the daily housecleaning; he may dry the silver and the pans at dishwashing time. Each new task requires a learning process. Each learning will have a period of only apparent finish,



Fig. 63.—Standing on a steady chair this two-and-one-half-year-old boy helps rinse the sturdier dishes and thus takes one step in learning to assume responsibility.

which will be thrown off balance by distraction. Yet, with patience and practice (particularly if the practice is companionable and fun) each will eventually find a state of integration and automatic smoothness.

Each stage of instability in the learning may produce some emotional repercussions; each stage of integration will result in emotional freedom and rest. Some personalities absorb the emotional repercussions of new learning in their stride, showing, in periods of strain, little more maladjustment than slight extra

fatigue. Other personalities take each of the new learnings required by life so hard that they seem constantly upset emotionally. Such children require a longer time in which to integrate or stabilize learnings before new demands are made upon them. Almost every person has some areas of learning in which integration comes more easily than in others. For example, some children take to intellectual learnings with great ease, yet take unusually long periods to stabilize motor learnings. Other children find the reverse true. Some children find social adjustments no demand to speak of, yet find every habit-training adjustment difficult to make. Here, as everywhere in child care, an awareness of individual differences is of extreme importance. Each child is in many ways a law unto himself, yet each belongs to the human race and grows according to certain fundamental laws. Each can, therefore, be understood better if these laws of growth are understood.

TOPICS FOR CLASS DISCUSSION

1. Fill in your developmental chart for social development, and for the development of emotional controls and expression. Pay especial attention to the developmental patterns of fear, anger, sympathy, and other emotions (see Jersild and Murphy references below).

2. Review your developmental chart at each age level. (a) What is a newborn baby like? What can he do? What kind of daily regimen should he have? What kind of physical and psychological environment does he need? (b) Same for year-old child. (c) Same for three-year-old child. (d) Same for five-year old child. (*To the instructor:* This question may be used as the basis for a term paper. The following question [No. 3] may also be used as a basis for review of the entire content of the course. The children observed by the students throughout the last chapters may now be written up as case studies, which would include not only the developmental history of the individual children, but something of their general physical and psychological heredity backgrounds and of family relationships and other emotional environmental factors. The student must be warned not to be tactless or otherwise offensive in gathering these latter data.)

3. Observe your child and one other child of five years or younger. Compare these children with your developmental chart and with each other in the various aspects of development. (Recall here the warning in Chapter I against a too rigorous application of average standards.) With this in mind, discuss the general development of the children you have observed. What, if any, are their areas of lag? What, if any, areas of acceleration do they show? What factors in their growth explain these lags or spurts?

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