Some characteristics and requirements of childhood / By Alice Ravenhill.

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Alice Ravenhill.

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1908

SOME CHARACTERISTICS
AND
REQUIREMENTS OF CHILDHOOD.

'THE AGE OF INNOCENCE.'
(Sir Joshua Reynolds.)

Some Characteristics

AND

Requirements of Childhood.

BY

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PREFACE.

THE substance of this little book is based upon a series of articles, entitled *Childhood and its Requirements*, which appeared in "The Guardian" during the winter of 1905-6; and the reason for its appearance is found in the often repeated requests that these articles might be collected and republished in more permanent form.

The necessary permission having been courteously granted by the Editor of "The Guardian," the original series of six articles has been revised and largely re-written, the treatment of the subject being made more complete by the addition of two new chapters, which deal respectively with the fruitful subjects of *play* and *adolescence*. A small Bibliography is also appended, for the guidance of those parents and teachers who wish to gain a fuller knowledge on many points to which, necessarily, a quite insufficient amount of attention is devoted in these pages. Thus it is hoped partially to atone for the cursory review here taken of a vast and complex subject; a review which, though slight, is designed to be suggestive, and thus undeserving of the reproach of superficiality.

The prolonged period of helpless infancy, succeeded by a still longer period of immature childhood and adolescence, is a characteristic peculiar to the human race, and affords unmistakable evidence of the ever-increasing complexity of structure, more perfect organization, and higher degree of intellectual development which distinguish man from the rest of the animal world. Whereas the chick is practically independent when hatched, and the blind puppy attains almost the level of a mature dog before it is seven weeks old, the helplessness of the human infant leaves him for months entirely at the mercy of his surroundings, and calls for the exercise of infinite care and tenderness

over many years, if he is to reach man's estate in full possession of all his faculties. Yet in this weakness is hidden man's strength; for this long period of immaturity not only lies at the root of family life (itself the foundation upon which the edifice of civilization is reared), but is associated with the plasticity and educability which characterize childhood, qualities which, when wisely utilized, enable each individual and each succeeding generation to progress intellectually and morally.

To maintain progress, however, there must be efficiency, and efficiency, in its turn, depends upon the attainment by each individual to a healthy maturity; that is to say, in possession of a well-balanced, cultivated mind, a healthful, self-controlled body, a capacity for social life, and well equipped for intelligent self-support. Therefore, Dr. Johnson's familiar words appeal to us to-day with unabated force. "To preserve health," he said, "is a moral and religious duty. Health is the basis of all social virtues." Happily, the belief in a form of fatalism which possessed a portion of the public not long since is now controverted; human beings are *not* inevitably the helpless victims of an inexorable and predestined fate; environment *can*, in some degree, neutralize a bad heredity, even as it does adversely influence a good one. Happily, too, there is evidence of more thought being devoted to the results upon the next and succeeding generations of a reckless violation of moral and physical laws by those to whom is intrusted the power to transmit the sacred gift of life. Further, the wholesome conviction is gradually gaining ground that the *right care* of children is a very responsible work; a work which demands intelligent study and adequate preparation; while among the mass of arguments confirming the views advanced of late years by moralists and biologists, those based upon *hygiene*, upon *education*, and upon *preventive medicine* carry far greater weight than heretofore.

It was with the object of drawing the attention of those whose time does not permit the study of more detailed books on the subject, to the significance of childhood, to its potenti-

alities, to its immaturities and to its requirements—that the original articles were written. It is with a similar object that this little book has been prepared; it is offered for the acceptance of a public too busy, perhaps, to devote much time to the matter, but nevertheless desirous of gaining at least a slight insight into that process of becoming a healthy child, upon which the study and observations of the last half century have thrown so much and such suggestive light.

ALICE RAVENHILL.

June, 1908.

SOME CHARACTERISTICS AND REQUIREMENTS OF CHILDHOOD.

CHAPTER I.

GENERAL CHARACTERISTICS OF CHILD LIFE.

SOME few years since, a great lover of children and a careful student of child-life defined the objects of his scientific observations as "bundles of possibilities, mostly unsolidified." The outcome of his studies (based upon previous medical training, and that of other skilled observers), is now, fortunately, available for the guidance of those upon whom devolves the care of these little "bundles," during the years when the process of crystallization into adult form is proceeding apace. It is no exaggeration to speak of the new-born baby as unsolidified; indeed, the condition of immaturity persists for many years; only towards the age of twenty-five is physical development complete; while, as regards the brain, no definite date has yet been assigned when its powers of development are known to cease.

To comprehend, and then intelligently to turn to practical account, all that is implied in this definition, it is necessary to learn something more than is apparent by mere observation of the outward man. With this all are so familiar that few experience any curiosity as to the "fearful and wonderful making" of the body to which the psalmist referred.

Probably it has not even occurred to many to consider how admirably adapted the human body is to the work it is required to perform. The symmetry of an active, athletic man, the graceful outlines of a healthy, well-developed woman, frequently excite admiration; but who compares the face and form of either with those of our domestic animals, or notes the superior

advantages enjoyed by "God's images" on earth? The relatively small head, for instance, of which the greater part constitutes a bony box for the elaborate and complex brain; the expressive face; the eyes, so set as to command a wide range of vision without constant turning of the whole head, and sheltered from injury by the projecting brows and long lashes; the ears, shaped to collect and to convey sounds to the brain; the nose, placed to increase our æsthetic enjoyment or to act as a sanitary scout; the mouth, formed for the production of a great variety of beautiful sounds (not, as in most animals, developed on a large scale for the sole purpose of eating), are but a few of these noteworthy characteristics. In the horse, dog, ox, or cat, the fore-limbs are mainly employed to support the heavy trunk; but in man, distinguished by his ability to maintain an erect position, the arms are so attached to the shoulder girdle that they can be used in a hundred different ways—to push, to carry, to lift, to swing, to throw, to dig, to execute his every wish,—while the human hand constitutes a powerful, yet most delicate and supple instrument, capable of infinite training and of skilful adjustment to an endless variety of uses.

There are still misguided folk who, ignorant of its important functions, cramp and distort the human foot in the mistaken idea that its natural size and shape are wanting in beauty and proportion; whereas, though the feet of men are relatively far larger than the claws, hoofs, and paws of birds and beasts, yet in this size, is found one source of man's supremacy; for, without a sufficient base, even the exquisite adjustment of muscles and bones, and the controlling power of brain and nerves, would not suffice to maintain his upright position, nor permit of a steady poise during his free and varied movements.

But some at least of these numerous powers of sight and hearing, of smell, and speech, of work and activity, are as undeveloped in the tiny infant as are the hair and teeth of later life. The process of their acquirement is coincident with that gradual progress towards maturity which characterizes the early years

of existence, and is associated with the development from what is relatively simple to that which is highly complex.

It is still beyond the power of man to define what vital force is, or to explain in detail the process by which the human form evolves from the microscopic speck of jelly-like substance, from which, in the first instance, each form of life develops. All that we do know is, that this minute, spherical "cell," as it is technically termed, constitutes the physical basis from which the adult organism develops, whether it be an oak or a chicken, a lily or a child. By a series of rapid changes, under favourable conditions, the single cell multiplies, and, in the process of multiplication assumes new forms, from which, in the case of a human being, the skin and bones, blood and nerves, heart and other organs gradually develop. Each individual body is thus composed of countless millions of cells, every one of which comes into being, grows, reaches maturity, declines in vigour, and finally dies, being, in most instances, replaced by another of the same character. The variety of structure and diverse functions of these cells is very great, so also is their size and duration of existence, as well as the period of life at which their various activities are most marked.

The structure of the body has been roughly compared to the clothes we wear. Usually observed collectively and referred to as a whole, they consist, in detail, of a series of garments, each garment fashioned on a different pattern and composed of a different material (cloth, silk, wool or linen), these materials in their turn, being woven of varied textures—coarse, fine, smooth, rough, close or open. Similarly the body is familiar to us as a whole; but beneath the outer covering of skin and hair, the bones and muscles, glands and nerves, heart and lungs, liver, kidneys, and many other organs, correspond roughly to the above-mentioned variety of garments; each organ or tissue being, so to speak, woven of its own special kind of cells, which cells, however, in many cases, vary in their structure and elaborate their functions as age progresses.

For example, at birth, the baby's bones are still relatively soft, more or less gelatinous, little rods and plates; but the myriads of cells which make up these pliable bones possess the power of absorbing lime and other salts into their own substance, so that bit by bit the transformation takes place into the firm, strong skeleton of the grown man; meanwhile, similar activities are present in the cells of which the brain is built up, or among those responsible for the conversion of food into lymph and blood. Still another variety of cells, those of which the bowels or kidneys are composed, for instance, prepare certain products of the bodily activities for excretion, in order that only healthy blood shall circulate through the tissues, and so secure that no accumulations of undigested food residues shall predispose to ill-health and prejudice nutrition.

This condition of ceaseless cellular activity continues all through life; its cessation means death. The body must not, therefore, be considered as a hard, fixed, stable mass, but as a commonwealth of living units, each of which breathes, feeds, contributes by its strenuous work to the well-being of the whole, and finally dies. Now in infancy, and until growth is complete, there must be a constant increase in the actual number of the cells of the body, as well as a steady supply of new ones to replace those which are worn out; and to permit of this process, known as growth, suitable nutrition is indispensable; without it, development suffers arrest.

The fact has already been mentioned that the length of life varies widely among these cells; it is of interest to know that some live, if uninjured, as long as the individual into whose structure they enter—*e.g.*, the nerve cells in brain and spinal cord—while others exist but for a few days, such as those which form the outer skin. Thus the peach-like bloom on a baby's cheek consists actually of the *dead* cells of the epidermis, which are pushed off by a fresh growth behind, only in its turn to be rapidly replaced by another crop. Naturally this process of constant shedding of the skin is not confined to the face; the

white "dust" adhering to the inner side of woollen stockings, and visible when these are of a dark colour, shows the same condition to be active over the whole surface of the body.

Life, then, is a process of ceaseless growth, development, and change :—growth in size, development in power and complexity, change in relative proportion as regards size, complexity, and structure. During the first seven years of life, development takes place chiefly in respect of size ; later on, it is more directly associated with the elaboration or increase in complexity of the tissues. The weight of the body at birth, for instance, is less than one-sixth of its weight in the seventh year of life, the increase in size taking place chiefly in the trunk and limbs, the relatively huge head and short limbs of the infant approaching gradually nearer to adult proportions.

But changes even greater than these external modifications go on in the internal organs ; by the time maturity is reached the heart is from twelve to thirteen times larger than it is at birth and the lungs have increased twenty-fold ; but, by contrast, whereas, in the infant, the weight of the liver is one-eighteenth that of the body, in the adult it represents but one thirty-sixth ; and, while the weight of the muscles amounts to 45 per cent. of the total weight of a grown man, they constitute but 23 per cent. of the weight of a young and helpless baby.

The infant's brain is relatively large and soft, usually attaining at maturity about four times its original mass ; but, as has been already hinted, in respect of complexity, its progressive development under favourable conditions is incalculable, and is indefinitely prolonged. The size of the brain at birth, which amounts to about 14 per cent. of the infant's total weight, is consequent upon the fact that, as all vital activity depends upon the nervous system of which the brain is the controlling power, it is necessary that provision be made at birth, by antenatal cerebral development, for the immediate exercise of certain functions essential to life, such as the power to breathe, to suck, or to digest. But it is not till after the first six or seven years

that this relatively big, simple brain begins directly and rapidly to assume the complexity which is associated with a more advanced development of the intellectual processes. The little child quickly and readily absorbs new impressions and gains infinite experience during its earliest years, but its brain tissues are not yet ripe for sustained or concentrated mental effort nor to express accurately its immature ideas.

It is most important to bear in mind, when considering the development of the normal child, that all these periods of physiological transition proceed more or less independently one of the other; the growth of the various parts is not parallel, continuous or regular, but irregular and unequal, hence instability. Nevertheless there is good reason to assume that actually the whole process follows a definite though still dimly defined order; but the subject calls for much more research than has hitherto been devoted to it. The details of physiological development in each child are also powerfully influenced by heredity, by race, by food, by surroundings, by constitution, and by care.

In further illustration of these two points, (1) the immaturity of the child with the irregular development of its parts and (2) the imperfect appreciation of these characteristics of growth among even the more intelligent classes of the community, reference may be made to such poorly recognized facts as that the eruption of the teeth is affected by a child's nutrition, or that the formation of strong, straight bones depends upon fresh air, cleanliness, and suitable food in infancy. At present there are very few people who understand or take into account how prolonged is the period of bone formation. The ossification of the spine, for instance, though proceeding rapidly from the fourth to the eighth year, is not complete until the fifteenth, while the epiphyses of the long bones do not unite with the shafts of the bones till about the twentieth year.

Again, while many mothers deplore the susceptibility of infants to bronchitis, or of school "babies" to infectious diseases and ear troubles, how few have troubled themselves

to learn that at least a partial explanation is found in the immaturity of the children's bodies, and in the unstable condition of their parts. Physiologists tell us that the division at the base of the windpipe into the two bronchial tubes is actually higher, that is, nearer the mouth, in infancy, than it is in later life,—a good reason for early training in nose breathing, and for proper protection of the lungs by suitable clothing, as well as for the avoidance of sudden and violent changes of temperature. It has also been pointed out that the proportion of phagocytes present in the blood of children is definitely smaller than in adults; (it is these phagocytes which attack, and, where sufficiently numerous and vigorous, destroy the micro-organisms of disease which gain admittance to the circulation). At birth they constitute about 28 per cent. of the total number of white blood corpuscles as compared with 70 per cent. in manhood, while the germ destroying power of the blood serum is also stated to be less in infancy than in maturity.

Another example of the provisional character of childhood is found in the Eustachian tube, the passage which connects the throat with the middle ear. This passage is actually broader, shorter, and straighter in the infant than in the adult, thus facilitating the transit from the throat to the middle ear of infective or poisonous matter; when to this is added the further fact that the bones of the skull, in which the middle ear is embedded, are still more or less cartilaginous, it is no longer a matter for marvel that throat troubles spread quickly to a child's ears, and, if neglected, so that an abscess or "gathering" forms, that the imprisoned pus penetrates these cartilaginous bone plates to the delicate and closely approximate brain, causing premature death; further, the narrow larynx of childhood is one cause of complications in diphtheria.

It is no old wife's tale, therefore, but a physiological fact, that if a child attains its eighth or ninth year without suffering from whooping-cough, measles, or diphtheria, its chances of escape, or, at most, of suffering slight uncomplicated attacks

of these diseases, are manifoldly increased. As a set-off, however, against these and many more susceptibilities and differences in form and in structure, which are associated with immaturity and coincident instability, is the fact that the whole lymphatic system, with its valuable nutritional and protective functions, is remarkably well developed in early life.

Limits of space unfortunately forbid the advance of further illustrations of the unripe condition of a child's body; the general statement only can be made that a study of its organic development impresses its purely provisional character at every stage. Heart and lungs, for instance, stomach and kidneys, blood and bones, nerves and blood-vessels, vary from year to year, in their size and development, or in the physical and chemical proportions of their tissues, to a degree quite unsuspected by those who are content to see in the child the adult in miniature.

That the necessary care demanded by these temporary, but most important, conditions and phases has been neglected in the past is one reason for present-day anxiety as to the efficiency of the population. It remained for the twentieth century to lay stress on the fact that children are unfit for any form of sustained mental, moral or physical strain; that their growth is easily arrested, their development quickly impaired, their potentialities starved or perverted, by unfavourable conditions, by unsuitable food, by repressed energies, by premature and prolonged work, or by insufficient stimulus.

It is to the light thrown by biology upon vital processes that we are largely indebted, too, for the teaching that the child is subject to those physical laws of nature to which recognition has been accorded for centuries past in respect of every other manifestation of life. It seems strange to think how recent is the realization that certain physical characteristics are common to all forms of living matter, and call for similar conditions of care and environment, if growth and development are to be normal. Biological research has also made abundantly clear that the more completely primitive, innate instincts are superseded by the

development of the higher intellectual faculties, the more prolonged is the period of dependency; the greater the degree of educability and plasticity possessed by the organism, the less competent it is for early self-dependence; by virtue of Man's high estate, indeed, his early helplessness is greater than is that of any other living creature.

In human beings, the elaborately complex nervous system (which develops only deliberately even under the influence of appropriate nutrition and stimulus), qualifies a human being to adapt himself almost indefinitely to new conditions as they appear; if, however, early environment be unfavourable, this plastic capacity dwindles or atrophies. When it is realized that the efficient fulfilment of his special work in the community depends upon the exercise of this capacity by each individual, the primary importance of prolonging the period of childhood in accordance with the demands of physiological development rather than of curtailing it in conformity with unenlightened convention, becomes immediately obvious. This question is not one of parental opinion or of economic convenience, it is national in its bearings, for it has been well said that "the position of each nation as a civilized power, as well as of each individual in society, is largely determined by ability to respond to new situations in new ways;" an ability mainly dependent upon the influences brought to bear during the first sixteen years of life, and on the conditions under which that most important period is passed.

To safeguard these influences and to secure desirable conditions during infancy and childhood is no easy task at this stage of civilization; it calls for all the resources and assistance which can be rendered by hygiene, or looked for from intelligent educational methods.

In common with lowlier forms of life, the child possesses certain characteristics to which recognition must be accorded, and depends for healthful development on an adequate provision being made for the chief requirements of its daily

life. Of these vital characteristics, one group is exhibited continuously, the other periodically. For instance, muscular movements, voluntary and involuntary, the power of receiving and responding to an infinite variety of stimuli through the agency of the nervous system, all the functions of bodily nutrition, of excretion, and of respiration, are ceaselessly active in the body throughout life; they are a constant manifestation of varied forms of energy and as constantly is the body undergoing a series of intricate chemical changes, associated with the wear and repair of the tissues. It is, however, otherwise with the equally important functions of growth and reproduction. Of these, the one is associated chiefly with the early, the latter with the adult, periods of life; both manifest themselves periodically, and both depend for their normal exhibition upon the general well being of the organism, a condition which is maintained by the activities of the first-named group of vital functions, for which the elementary requirements of a healthy existence must consequently be provided.

Obviously there must be a source of supply for all the energy thus expended. Experience and scientific research show that this is to be found in the adequate provision of pure food, air, water, and of warmth, as well as in suited opportunities for exercise, for rest, and for education (which last may, for this purpose, be defined as a training in the right employment and control of energy, and the provision of requisite stimuli for brain, sense-organs and body). Appropriate nutrition, environment and stimulus comprehend, therefore, the chief requirements of childhood; they demand varying proportions of human care, of available space and of money, the ingredients being mixed largely with brains. The free employment of the latter is perhaps of primary importance; for by their use, and assisted by the knowledge of child psychology, physiology and hygiene, now at our disposal, the problem of how to rear healthy children should no longer remain unsolved, nor be considered insoluble.

CHAPTER II.

ELEMENTARY REQUIREMENTS OF INFANTS.

In the opinion of experts, babies of all classes are born practically on a physical equality. From eighty to eighty-five per cent., enter the world physically healthy; each generation having a strong tendency to revert, in spite of unsatisfactory parentage or of disadvantageous environment, to a mean physical standard, which is described by Professor D. J. Cunningham as the "inheritance of the people as a whole." But the chances of maintaining this physical standard may be prejudiced, even at the moment of birth, and are much influenced by the infant's heredity, by its ante-natal experience, and by its individual capacity for adaptation to a widely-diversified environment; the shock of birth, indeed, may overtax this last-mentioned quality in the weakly or diseased infant.

This marked and inherent possibility of variation in each child receives, as yet, but scant attention from the general public; it may be because the problem of heredity is so infinitely complex; though most people surely can understand the general principles of what is known as Galton's Law of Ancestral Inheritance, which throws valuable light on the subject. This law states, as follows:—"That the two parents between them contribute, *on the average*, one-half of all the inherited faculties (or characteristics) possessed by the child, to which each parent presumably contributes one-quarter. The four grandparents contribute between them one-quarter of the child's whole organization or each of them one-sixteenth, and so on; the sum of the series, $\frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \frac{1}{16} + \frac{1}{32}$, etc., being equal to one." Thus, in the tenth generation, a man has 1,024 tenth grandparents, and represents the product of what may be fairly described as an enormous population, the mean or average of which can hardly differ from that of the general population, especially so when allowance is made for the above-mentioned

tendency to revert to the ancestral type. Nevertheless, those in charge of children ought always to bear in mind certain possibilities which make for individuality or idiosyncracy. For instance, some characters peculiar to a family may remain latent for one or for many generations, and may then express themselves with great force in a single individual, marking him out as an ugly duckling in a family of conventional chicks. Other potentialities may never achieve expression at all, in consequence of ante- or post-natal conditions which prematurely check development, an arrest more prevalent than is generally recognized, and responsible for many modern problems, social and industrial. Following, too, upon inter-marriages through long periods of time, certain distinctive racial characters may be accentuated, while the tendency to revert to a common mean diminishes in force.

It thus becomes the duty of child guardians, professional or amateur, to provide such an environment for their charges that no desirable potentiality shall be suppressed, but that all favourable possibilities shall be drawn forth, exercised and realized. Upon parents devolves an even greater weight of responsibility, for with them rests, to a certain degree, the control of a child's heredity. The man (or woman), tainted with a disease transmissible to the offspring of his marriage, sins against future generations; the victims of even moderate alcoholism should know that self-indulgence means nervous instability, if not mental disorder or disease to their children; the parents who permit continued fatigue and anxious, strenuous work to be the lot of the expectant mother deprive the infant, before its birth, of a fair start in life. For though the child epitomizes the characteristics of all its ancestors, yet fifty per cent. of his small personality is derived from his immediate progenitors, and, during the nine months of pre-natal existence, the growth and health of the infant depend upon the nutrition of the mother to an even greater degree than they do during the succeeding suckling period.

Again and again has attention been called to the fact that morbid ante-natal conditions may and do prejudice infantile life (and the national health), by causing pre-natal death (abortions), premature births, or post-natal disease or deformity. There are facts in this connection which every young man and woman should know before marriage, in justice to a race, suffering for the moment from deterioration only (a condition susceptible to removal by favourable environment) but threatened with degeneration, unless the population awakens quickly to the true and extended significance of parental responsibilities towards the next generation.

In addition to the general diffusion in suitable form of information on these and kindred subjects, definite preparation and training for the duties of motherhood is an absolute necessity for young women of all ranks of society. Ignorance of an infant's requirements is not confined to the very poor and unlettered, neither can these requirements be described as simple or elementary; for the artificial character of modern life calls for much more intelligent knowledge, as distinct from instinctive care, than was demanded a century ago. Mothers and nurses to-day need the courage of conviction to readjust many nursery methods, never laudable but now definitely pernicious, in consequence of a changing environment and an increase of the neurotic temperament among their tender charges.

There are, from the medical point of view, three critical periods in child-life. Of these, the first is infancy, which practically embraces the first three years of life, when the digestive tract is the weak link in the chain, and want of ordinary care the instrument by which it is most generally severed. "Food-poisons"—as an American physician has described the mistaken preparations of artificial foods, upon which so many erroneous efforts are made to rear children—uncleanliness, insufficient warmth, and incessantly recurring loud and shrill noises constitute the greatest menace to the well-being of nurselings. The human infant, in spite of its absolute helplessness,

is born with a great capacity for adapting himself to suit his environment; nevertheless, violation of every law upon which depends normal growth and healthy development brings inevitable penalties, of which the rate of infant mortality is a faithful reflection, and of which, also, the halt and maimed, stunted and diseased among our population afford a reliable chronicle.

It is probable, however, that in this great power of adaptability is found one cause for the perpetuation of carelessness; the baby bears so much before owning himself conquered that ignorance trades upon and shelters itself behind the fact. Yet detection of the signs of malnutrition is not difficult; the plump, pink, happy baby, which at first only wakes to be fed and washed, or which, a few weeks later on, lies placidly cooing in his cradle, making acquaintance with his novel surroundings, presents a striking contrast to the white, wizened, peevish infant, restless even in sleep, fretful or unnaturally quiet, teased with physical discomforts, and ever distressed and distressing; or the unhealthy, fat, ricketty product of patent food-stuffs, too heavy and ill-nourished to be normally active or alert, yet admired as a faithful copy of familiar, misleading, pictorial advertisements.

Excellent and simply written handbooks upon the right rearing of children are so easily obtainable that it is to be regretted that they are not more generally read and acted upon. The reminder that there is much truth in the quaint old saying that the only physicians whose attendance need be requested by the well-qualified mother are Dr. Quiet, Dr. Diet, and Dr. Merryman ought no longer to be necessary; the first two should be present from birth onwards; the third may be called in after six or eight weeks. For, at birth, warmth, quiet, cleanliness, suitable and non-restricting, woollen clothing (nun's veiling is an excellent material for most of the little garments), and suitable nourishment, fulfil a baby's needs, until the early stages of his adjustment to his new surroundings have been accomplished.

At first a child's sensations are confined almost entirely to those conveyed through the skin, chiefly pressure and cold. About the third day the first evidences of hearing are apparent; but sight, as known to the adult, develops very gradually, vision for the first fortnight being confined, so far as can be observed, to the distinction between light and darkness. The sense of taste comes early into evidence; though it is hard to say to what extent the infant is capable of exercising discrimination by its aid. Compayré assigns a considerable degree of development to this sense at birth, though, if this belief be true, the delicacy of perception must be blunted before infants could be, as they are, coerced into the consumption of gin, and compelled to submit to the administration of black currant jam! Vague sensations of hunger, thirst, and discomfort are, however, soon expressed. When it is about four week's old, an infant's eyes will show both attention and intelligence, naturally of a transient character; but pleasant sounds, such as singing of soft music, will stimulate their manifestation, and pleasure will be testified, too, by a smile. Tears are not usually shed till a week or two later, when the power to hold up its head is generally developed in a healthy child, while at about eight weeks a baby has developed sufficient power of muscular coordination to fix its eyes on a near object without squinting.

But, though so immature, an infant's feelings and general sensations are peculiarly susceptible. It must be therefore once more emphasized that the great need of a new-born baby is warmth, and the necessity continues through all the early years of life. Not the warmth of gas-lit, stuffy, overcrowded rooms, but the comforting warmth of cradle or bed, supplied with a well-protected hot-water bottle; the soft cosiness of woollen garments, protecting alike neck and arms, wrists and ankles; the genial glow of sunshine, the welcome heat from a good fire, before which limbs can be stretched, and, later on, bedtime stories told, while the window-board, properly adjusted, preserves the purity of the air in all weathers and at all seasons.

Impure air, dirt and cold undoubtedly cause discomfort; loud, coarse sounds startle and alarm; rough handling disturbs, and even terrifies.

Quiet and automatic regularity are essential to the well-being of young infants; noise, violent movements, sudden changes of temperature, irregularity in attention to their wants, all interfere with their delicate mechanism at the time, and may damage mind and body for life. One, for instance, dreads to forecast the results of the vibration of motor omnibuses upon these unstable nervous systems, or the effects upon such susceptible organisms of the heated, fœtid atmosphere of public buildings, and of sleep disturbed by brilliant light or violent changes of temperature. After the first few weeks of life gentle play and merry movements with its mother meet the child's ever-changing and growing need for exercise and pleasurable stimulus; but too many new faces and new toys, over-excitement, caused by constantly replacing one novelty by another before the baby mind has grasped what the first has to teach, are to be especially deprecated at this age period.

A protest must also be entered against the use of the so-called "comforter" in infancy. Apart from the risks to health associated with the inevitably filthy rubber, the action of constant sucking causes swelling and congestion of the mucous membrane of the hard palate; the continuous pressure exercised upon the roof of the mouth, still cartilaginous in consistency, arches the palate, impedes the passage of air through the nose by encroaching on the floor of the nasal cavity, and causes the jaw to assume a V shape, which interferes with normal dentition. Then the cramped and projecting teeth cannot fulfil their duties of mastication, so that nutrition is prejudiced, free nasal respiration is interfered with, and the abnormal, swollen condition of the mucous membrane fosters adenoid growths. A well-trained, healthy infant instinctively at first rejects this foreign body from its mouth, this natural instinct is not, however, strong enough at this tender age to withstand the per-

sistence of the ignorant nurse or mother, and so the habit is acquired, fraught as it is with far-reaching ills.

A safe guide as to nutrition during the first few months of life is found in a steady gain of about 1 oz. a day in weight; the first check in the progress of a normal healthy child being usually associated with the onset of teething, about the seventh or eighth month, though, where mothers are able to nurse their infants, this set-back is far less common. A further reason this for the earnest hope that public opinion will shortly secure for nursing mothers every condition favourable to their fulfilment of this natural function.

Unfortunately, very few people realize all the needs which *maternal* feeding fulfils for the child. Healthy nature furnishes, in the first place, exactly the quality of nourishment required by the nursling, a quality which varies continuously throughout the normal period of nursing; from week to week the proportion of nutritive ingredients is adapted to the progressive demands of growth. Protein or body-building materials, fat and carbo-hydrates are present at birth in almost equal proportions in the mother's milk, for the infant needs warmth and tissue-forming food, but relatively little of the carbo-hydrates which are later on required in ever increasing amount. *They* fulfil the demand for a rapidly consumed fuel, not necessary at first in any large quantity owing to the vegetative existence and small muscular development of the baby, but as capacity for muscular activity increases, so also do these constituents figure more prominently in the child's natural diet.

In the second place, the quantity is, given a healthy nursing mother, accurately adjusted not merely to daily needs, but to progressive capacity. For the first month the infant's stomach can only receive from one to two fluid ounces at each feed; from two to six months a gradual increase to six ozs. is made; until, when weaning is imminent, as much as eight ozs. can be consumed, though at longer intervals. Compare with these physiological facts the common practice of supplying six and eight ounces of

milk at each feed to very young, bottle-fed infants. Their inability to consume this large quantity encourages the reservation of the remainder, which, becoming stale, sets up a long train of trouble. Neither should a healthy infant be fed with a spoon, because the fatigue of sucking acts normally as a safeguard from the ingestion of an excessive quantity of milk; when this is absent, repletion is possible and may result in permanent dilatation of the stomach, with all its attendant miseries.

In the third place, an infant, nursed as nature designs, consumes a pure fluid, at the right temperature and with the right rapidity; whereas the hand-fed child often sucks milk of questionable purity, from a more or less dirty bottle, at a most variable and uncertain temperature, with an equally variable rapidity.

In the last place, no other known milk can be exactly modified to resemble that of the human mother, the analysis of which is inserted in order that it may be compared with that of the cow, fresh or diluted with water.

	Protein.	*Fat.*	*Milk-Sugar.*
Human Milk (average)	1·5	3·5	6·5
Cow's Milk (fresh)	2·5	4·0	4·5
Mixture (cow's milk, 2 parts) (water, 1 part) ..	1·6	2·6	3·0

The milk of most animals is too rich for a human infant; the relative richness of mammalian milk being connected with the length of time with which weight is doubled in the offspring. In the goat, for instance, this advance is achieved in nineteen days, in the calf it is accomplished in forty-seven, but the baby occupies one hundred and eighty days in the process.

It is a well-known fact that when cow's milk is modified for infant's use, certain essential proportions of nutritive principles are disturbed, which are poorly restored by additions of cream and sugar; while the most infinite care in preparation cannot meet one insuperable objection, that, not alone is the chemical composition different of the two kinds of milk, but the principal body-building substances, albumin and casein (collectively called Protein), are present in different proportions and forms.

It must be remembered that milk is a fluid only when outside the body; so soon as received into the stomach it clots, owing to the presence of a rennet-like ferment in the gastric juice, and subsequently curdles, in consequence of the production of lactic acid; these profound internal alterations making it practically a new substance. The density of this clot depends upon the amount of casein and lime salts present in the milk; where these are high the clot forms rapidly and is very tough. A reliable estimate gives six parts of casein to one part of albumin in cow's milk; while not only is the casein of mother's milk not identical in chemical composition with that found in cow's milk, but the percentage present is only equal to that of the albumin; the clot also is light and friable, of cow's milk it is dense and heavy. The process of clotting always precedes curdling (as is easy of practical demonstration with rennet and artificial gastric juice), because the alkaline salts present in the milk neutralize the acid first secreted by the stomach; then, as lactic acid is formed in the normal process of digestion, it turns the casein out of its partnership with the lime salts, and the casein, not being in itself soluble, falls down as a flocculent precipitate.

Where *artificial* feeding is imperative, efforts are directed to the modification of this dense clot by lime- or barley-water, and to the readjustment of the proportions of sugar, fat, and casein, in order to approach as closely as possible the analysis of mother's milk. Absolute similarity cannot be attained, even were the casein difficulty surmounted, for the cream of cow's milk does not contain the same proportion of oleic acid (a very easily absorbed form of fat) as human milk; while the mineral salts also occur in different proportions. The use of lime-water is now considered superior to that of barley-water to modify the density of the clot in cow's milk. The action of barley-water is purely mechanical, and, unless it be prepared at least twice a day, the child may suffer from its "sour" condition; the action of lime-water, on the other hand, is chemical, and apart from a constipating tendency, it proves usually beneficial, if

properly employed. Very satisfactory results in the particular respect of preventing the formation of a dense clot in cow's milk follow the employment of a 25% solution of citrate of soda; the addition of one-fiftieth volume of which to the milk precipitates the lime salts and much retards or entirely prevents clotting.

Various formulæ for the modification of cow's milk are published; but it is rarely sufficiently emphasized that the proportions of each food principle (protein, carbo-hydrate, or fats), as well as the quantity of milk, ought to be intelligently varied as the child grows. For the well-to-do, this is scientifically carried out according to doctors' prescriptions at the Walker-Gordon or similar Laboratories; for the less-favoured babies, make-shifts only are possible. Upon the difficulties incident to *hand* feeding it is unnecessary to enlarge; they include risks from dirty, disease-infected or sour milk, from the imperfect cleansing of the bottles, and from an absence of the constant care and attention to details, which demands a high order of morality if not of intellect.

Condensed milks are inadvisable in this connection for more than very temporary use; in most cases there is a great excess of cane-sugar present, and, with one or two exceptions, a great deficiency of fat, together with an absence of important vegetable acids; consequently nutrition is more or less affected. Where their use is unavoidable a small quantity of orange juice or a couple of grapes given daily between feeds may make good the last defect, and the administration, under doctor's directions, of small doses of cod liver oil is also advisable. No patent foods are admissible till a child is twelve months old, when flour baked brown in the oven, finely-crumbled bread-crumbs with milk or gravy, and milk tapioca or cornflour well cooked, all in strict moderation, fulfil every requirement as regards farinaceous food.

In conclusion, it is well to remember that delay in dentition is sometimes Nature's call for a fuller diet. Where the first teeth are late in appearance, therefore, obtain good medical

advice and study the child's diet; the need for the gradual introduction of good meat gravy, of raw meat juice, or of a small quantity of a lightly-boiled fresh egg is often indicated by this deferred dentition. In some observations on the causes of infant mortality made five years ago by the Medical Officer of Health for Derby, Dr. Howarth records that a very high death rate (255 per 1,000) existed among children fed on condensed milk; it equalled, indeed, that of infants reared on bread, rusks, arrowroot and other farinaceous foods. In the aggregate the various patent foods showed a death rate of 202 per 1,000, as compared with a rate of 177 among those fed on cow's milk and water, while among breast-fed babies the death rate during the first year after birth amounted to but 69·8. Further comment would be superfluous.

CHAPTER III.

FOOD IN CHILDHOOD.

More than a passing reference was devoted in the last chapter to the feeding of infants, because it is a national question of primary importance; for upon the diet from birth to the end of the first year depends, to a large extent, the efficiency of the individual and his economic value to the community. No language is too forcible in which to deplore the wilful ignorance and criminal carelessness which characterize too many modern parents, or to bemoan the inexcusable public apathy, which passively permits the existing drain on the population, and leaves to the few the arduous work of combating prejudice and of arousing appreciation of the magnitude of this evil. That it is one of the chief promoting causes of infantile mortality is common knowledge; that it is as well a potent factor in the continued prevalence of disease among our child population is less generally emphasized.

With regard to the diet of children from one year old and

upwards, certain broad principles must be borne in mind. Children have not only to live, but to grow. Relatively to their size they require more food than an adult, and this in increasing proportion as they pass from childhood through adolescence to maturity. Starvation therefore, or injurious food in early life, is indefinitely more prejudicial than in later years, for the whole process of normal development may be thereby seriously checked in some one direction, if not entirely arrested. Yet so poorly is the fact appreciated, that experts on the subject do not hesitate to ascribe mal-nutrition in children, where it proceeds from dietetic defects, as much to the consumption of improper food as to an actual deficiency in quantity.

It cannot be too much insisted upon that the immaturity of childhood must be recognized in this matter of the selection of suitable food-stuffs. Feeding has a very direct bearing upon both *physical* and *mental* development, and the child's diet should be framed to meet its needs as these vary from infancy onwards : neither can individual variations in taste and special requirements be disregarded in these days, when the neurotic child is a too common type. In such cases, as well as in those of children debilitated from poverty or illness, food must not only be suitable in quality, but must be consumed in sufficient quantity if the physiological balance is to be maintained.

Careful and prolonged investigation affords convincing proof that apart from certain purely pathological cravings, foods for which preference is felt are those best assimilitated. A model diet composed of materials repugnant to the individual for whom it is designed is a double extravagance, of which the waste of money is by far the less important. This does not imply unwise pampering of morbid or unhealthy appetites, but merely a recognition of the fact that the sense of taste is decidedly acute in childhood, and should not be disregarded ; and that the thorough action of the digestive juices depends largely on the stimulus afforded by desire and flavour. If the food be imperfectly digested, its products are not well assimilitated by the

tissues, and bad nutrition results. Nevertheless, these remarks must not be misconstrued. The tastes of children must be kindly but firmly trained to enjoy simple flavours; pickles, sauces, and seasonings should be stringently withheld, and boiled, broiled, roast or baked dishes should be preferred to fried food or rich stews.

It is helpful, however, to bear two or three points in mind when regulating the dietary of children. The debilitated and habitually underfed child needs patience and discrimination from those anxious to substitute wholesome and regular meals for unwholesome and irregular "snacks." At first its digestive juices may depend for their stimulus upon the highly-flavoured "chips," vinegar, or pickles, to which they have been habituated; the change to more insipid substances, such as bread and milk or rice pudding, must be effected gradually, if it is to be successful and enduring; herbs, onions, even sauces and syrups may be required temporarily to play a very prominent part in the daily diet as substitutes for more pernicious articles.

Children must also be early trained to masticate all food thoroughly; if the habit has to be acquired after the age of eight it calls for infinite patience and perseverance. The year-old baby can begin to gnaw small pieces of crisp biscuit, and food demanding mastication should be systematically supplied in suitable form (rusks, crusts, or biscuits), to develop the habit as dentition proceeds. Good mastication, apart from its other values, sets free flavours in the articles chewed and assists in gratifying the palate which, like all other sense organs, calls for exercise. Adults are liable to overlook this fact, and unconsciously run the risk of either rendering a child self-indulgent later on in its efforts to make good the previously deficient exercise of the taste organs, or of interference with the process of nutrition, which undoubtedly proceeds best where judicious and wholesome variety is made in the daily diet. The digestive system profits from enlarging its capacity to deal satisfactorily with a considerable range of food-stuffs after the third

or fourth year; provided always that the range be extended with judgement. A ready adaptability to circumstances has its value in the matter of food, as well as in other factors, which together make up our environments.

Food it must be remembered, is taken with three main objects:—(1) to build up the body, that is, to supply to the myriad cells of which it is composed the materials from which they can manufacture tissues and secretions, or themselves grow and multiply; (2) to replace the losses which are continuously occurring, in consequence of the vital activities ever in progress; (3) and last, but by no means least, to furnish substances which can serve as fuel to supply the energy and heat upon which all these activities depend. Our "daily bread" is divided into five classes of substances, which, taken in varying proportions, are found to supply these requirements, and representatives of which exist to a greater or less degree in the common articles of diet. In milk, eggs, meat, fish, cheese and poultry, the materials for building up the body tissues are present in high proportion and suitable form; combined with them is also a variable amount of the fat needed to furnish heat and energy, such as cream, butter, oil or suet. Additional amounts of these fats must, however, usually be taken, if digestion is to be efficient as well as the body heat maintained. Where fat in all forms is deficient in the daily diet the general nutrition is invariably affected; indeed, the serious tendency to rickets and various forms of phthisis in the children of the lower classes is attributed, in part, by some authorities, to the absence from their diet of sufficient fat food.

To supply some of this constant need for a source of heat and energy, however, a less costly class of food-stuffs than fat is fortunately available; though the one cannot entirely replace the other. These useful allies are found in the carbohydrates—to which a brief reference was made in the last chapter—a group, which includes all the starchy foods, such as bread, potato, rice, sago, tapioca, the many cereals now on the market, and all

forms of sugar, from chocolate to treacle. A certain amount of body-building material is also present in flour and macaroni, semolina, and cereal foods, notably oatmeal ; but it is practically absent from rice or tapioca, and wholly so from arrowroot. Potatoes even, when properly cooked, furnish a little body-building substance, as well as a high proportion of starch ; and carrots, as well as all fruits, are rich in sugar ; but in most cases vegetables are eaten on account of their salts, which are of great value to the body, and of their cellulose, or indigestible residue, which promotes the process of intestinal excretion, rather than for the sugar or starch which constitutes a part of their small percentage of solid matter.

It is a familiar fact that peas, beans, and lentils contain a high proportion of the body-building substance, technically termed " protein," which in a more concentrated and digestible form, distinguishes meat, eggs, and cheese ; they also afford a good example of the great necessity which exists for distinguishing between foods which on *chemical analysis* afford good evidence of high nutritive value, and those which *physiological evidence* proves to be well assimilated by the body. In the majority of cases, vegetable forms of body-building material are far less easily absorbed by the digestive organs than are animal, and cannot satisfactorily or entirely replace meat, fish, or eggs. Pease-pudding and lentil-soup may, and do, serve a good purpose once or twice a week in cold weather, or even more often where an active outdoor life is led ; but, just as town children constantly turn in disgust from the oatmeal porridge upon which the Scotch country lad grows strong and hearty, so do the artificial conditions of their existence demand for city weaklings more easily assimilated foods than constant pease-soup.

The last food substance to which reference need be made is water, an indispensable factor in nutrition ; for not only does about threequarters of the young child's body consist of water (a proportion which diminishes to 58 or 60 per cent. in adults), but a certain dilution with water is a *sine quâ non* of all the

chemical changes associated with growth. Water is a fundamental need of all life ; but in childhood it is almost as essential as fresh air, if the heavy nutritive demands of growth and constant activity are to be adequately met. The child from five to twelve years old *may* consume as much as two quarts of liquid in the twenty-four hours, and deprivation of water means not only a fretful thirst, but an actual hindrance to the rapid tissue changes natural throughout these years.

It may be wise at this point to correct a prevalent misapprehension which leads to unrecognized discomfort, much irritability, "naughtiness," and inattention, as well as to loss of appetite. I refer to the idea that a child must not drink immediately before or at the beginning of a meal, or when heated by vigorous exercise. A certain dilution with water is associated with the digestion of food, which is largely a process of fermentation. In concentrated solutions this biological action goes on slowly ; compare for instance the keeping qualities of ripe grapes or of dried raisins exposed to identical conditions in the store room. If the millions of tissue cells are to be nourished, and are to thrive, the process of digestion, assimilation and circulation must not be hindered by an insufficient supply of fluid; the normal loss, amplified by a larger expenditure during active exercise, must be made good by rapid receipts. A sluggish circulation from a paucity of fluids dulls the senses, promotes putrefactive changes (indigestion) in the intestines and favours auto-infection as a result of digestive disturbances.

Now there is little or no provision for the body to meet an increased call for water ; on the other hand there *is* ample provision for the elimination of any excess of water through the skin, the kidneys, the bowels, or by the lungs. The habit of drinking largely just before a meal should not be encouraged, but a good drink of water may be sanctioned with advantage under exceptional circumstances ; when the child is very hot, substitute tepid for very cold water. From half to three quarters of a pint is not too much for a child of eight to drink with its

meals. Remember always that pure milk does not quench thirst, but whey or butter-milk, oatmeal-, apple-, or lemon-water, are all good for this purpose.

Children live fast; they are unceasingly active when awake, and require a large amount of fuel food to furnish forth the motive power for this perpetual motion. The rapid pulse and respiration of the little child tell of the speed with which its bodily functions are performed. Consequently their diet must be well supplied with fat and sugar, while the intervals between their meals must not be too long. Where the adult is well fed with three meals a day, the child from two to ten needs five, and from ten to eighteen four meals are still necessary.

Certain other considerations must be also taken into account; for instance, the fat of meat is often abhorrent to children; it is unwise, therefore, nay, useless, where such is the case, to nauseate them by insistence upon its consumption. This essential ingredient of diet must be supplied in some other form. Butter and cream (the latter excellent with porridge or fruit) are often over-costly, but suet-puddings, in one or other of their multiform variations, are rarely refused. Finely shredded, fresh suet can be skilfully concealed in milk-puddings, and wholesomely prepared margarine can be well pressed into service where really good butter is impossible. Nor should it be forgotten that when eggs are at once cheap and fresh they supply fat in a usually most acceptable form. Any of these fats is to be preferred under ordinary circumstances to cod liver oil, which is, after all, but a cheap, though not always well assimilated, form of fat. Poor parents must also be cautioned against confusing Petroleum emulsion with cod liver oil, as it proves quite unassimilable by the human body and is passed unchanged through the digestive tract. Home-made toffee is a useful "fat" food for children, if taken *with the meals*.

It cannot be overlooked that the habit of sweet-eating at all hours in childhood, not only predisposes to dyspepsia, but lays the foundation for habits of selfish intemperance in later

years. At the same time, the craving for sugar must be respected—it is instinctive, essential, and laudable; indeed its satisfaction is a prime necessity where normal activity is to be maintained. For healthy children, two embargoes only need to be laid upon it. Discretion must be exercised as to the *quantity*, and as to the *time of consumption*. If sugar be freely supplied with meals, and in the form of "sweets" as a dessert, no supplementary nibblings or expenditure of halfpence thereupon must be permitted. Chocolate and bread form a first-rate supper for children, for good chocolate contains also an appreciable amount of body-building material besides the sugar. Fruit, too, preferably cooked, which contains very easily assimilated forms of sugar, should enter largely into the daily diet; if preserved, it should be in the form rather of jelly, than of jam until the child is eight or nine years old, for skins and seeds prove irritating to a young child's intestine. Apples and bananas, baked in their skins, or fruit "fools," are equally enjoyable and beneficial, for fruits and vegetables, green or root, supply most of the ballast necessary to assist in the excretion of indigestible food stuffs; reliance for the relief of constipation should, in the first instance, always be placed on an increased supply of water and of stewed fruits. Like sugar and sweets, all fruit in any form should strictly accompany meals.

All eating between meals taxes digestion, and paves the way for dyspepsia, not to mention self-indulgence. A mental specialist has recently laid great stress upon this point, especially on behalf of neurotic children. He says that nervous instability is actually fostered by the demands made on nervous energy for the digestion of these intermediate "lunches," while the associated indigestion increases the existing irritability of the nervous system—to the prejudice of the child's chances of normal development. He urges that meals should be arranged at intervals which will render these intermediate and casual refreshments unnecessary; advice rather hard to follow in small households, for at home all members of the family eat at the same

hours and school periods are of very similar length for children of all ages.

It is always well to serve some form of warm food or beverage with children's meals; for food must be raised to the body temperature before the digestive process begins; if, therefore, it be taken warm, heat and energy are saved to the little consumer, while in many instances digestibility and wholesomeness are thereby increased. Regularity, inviolable regularity, suitable variety, a constant recognition of children's needs in respect of quantity and quality, and attention to well-performed mastication, are all factors of major importance in the promotion of nutrition, but the few concluding words on the whole subject must be devoted to beverages rather than to a detailed consideration of these points.

Water and milk (skim-milk where whole-milk cannot be obtained) should constitute the sole beverages throughout child-life. Cocoa, made with milk, is admirable from the point of view of variety; made with water it possesses a negligible nutritive value, though it serves the useful end of supplying warmth and variety of flavour. Where, in consequence of illness or some transient delicacy, wine is ordered medically, it is well to combine it with jelly, and not to use it as a beverage, unless the doctor orders this, or spirits, to be administered for some special purpose in some special form. Under existing social conditions, too much care cannot be exercised to obviate the least risk of arousing any craving for alcohol; and other forms of stimulant such as tea or coffee, are quite unnecessary. Children should not be allowed to taste these beverages in the first place, but where indulgence or ignorance has familiarized them early with their attractions, the economic objections to their excessive use will possibly appeal sooner and more forcibly than arguments based on their physiological disadvantages. The transmission to the offspring of the results of alcoholism in the parents should also judiciously be made known to all boys and girls at adolescence.

CHAPTER IV.

NURTURE IN CHILDHOOD.

The fact that nurture is a forcible tool, placed in our hands to develop the powers of nature or to modify its defects, has been ably pointed out by Professor Arthur Thomson and certain other scientists, who are most competent to estimate the possibility of redressing a bad heredity by a good environment; some results of such remedial nurture are found in the records of philanthrophists and educationalists in all parts of the world. The proofs thus afforded of the admirable corrective, as well as preventive, influences which can be exercised on body and mind by favourable surroundings should cheer the hearts and strengthen the hands of those to whom is entrusted the care of children, though the task would be facilitated were the links between cause and effect externally and immediately obvious, instead of being difficult of detection; or were human beings as simple in structure and as strictly consistent in action as are the primitive forms of plant and animal life.

If the world-old experience of man had been systematically recorded, if even the true significance of the problem were universally appreciated, the right rearing of children would be relatively easy. But prejudice is strong and widespread; ignorance is fostered by indolence; accurate records of really useful observations are still rare and little known. The position is paradoxical; we are face to face with an utterly helpless being, yet one in whom must be recognized the living representative of complex hereditary antecedents and of varied social conditions, who, while possessed of certain characteristics common to his kind, yet conforms to no one defined type of either mind or body. We are responsible for the care of a creature, rapidly and indelibly influenced for good or ill by all he sees hears, touches, or smells; dependent for his existence upon certain suited yet variable proportions of food and warmth,

activity, repose and cleanliness, yet wholly incapable, during his early and most sensitive and susceptible years, of providing for himself either the environment or the food upon which his moral and physical efficiency depend.

In what proportion of cases does common-sense control the nurture of these immature organisms? To what degree does our knowledge of the enduring results of environment lead to the removal of children from the undesirable surroundings which depress, degrade and exhaust, mentally, morally, and physically? Alas! how small is the minority of adults which vigorously endeavours to furnish for all our child population the elementary requisites to healthful development, or to supply that kind of home and to provide that type of education which can foster, neutralize, or check those physical and moral qualities which need repression or call for stimulation.

Food, warmth, cleanliness, fresh air, sleep, exercise, and a suited education, comprise the elementary requirements of childhood at every period. To some of these attention has been already directed in connection with infants, and the subject of food, important as it is, cannot be further discussed here, but a few words on the need for warmth must find a place.

The old idea of hardening young children by exposure to cold and draughts or by clothing them in ridiculously curtailed or insufficient garments is quite inapplicable to the product of twentieth century conditions. The cold child is literally the starved child; its growth is temporarily arrested and its risks of contracting some form of illness are multiplied a hundredfold. Its energy is diminished, which means unnatural inactivity and coincident retardation of development. As the mercurial activity of children is one of their chief means of mental as well as physical development, the undesirable significance of frozen feet, blue hands and shivering bodies may be easily estimated. Food, warm clothing, rooms at a suitable temperature, are *necessaries*, not *luxuries*, for young children. Hot-water bottles in bed throughout the winter are a most desirable and

too little considered source of heat; they can be improvised, if necessary, from stone ginger-beer bottles or from workmen's tea-cans. [An unconsidered advantage attendant on this form of comfort which should not be overlooked is the promotion of personal cleanliness. The water within the jar or tin will be still warm in the morning, and may encourage to ablutions otherwise evaded by small folk, who naturally shrink from the use of water, of which the temperature, perchance, is not far removed from freezing point. Cold and uncleanliness are close allies.]

To the well-to-do ample conveniences for daily baths are now a matter of course. Should not the comfort and benefit derived from so necessary a feature in the daily toilet, stimulate to greater energy in securing similar advantages for those who are in many ways less favourably situated? Warm baths at bedtime, with soap and plenty of friction with soft, thick towels, are best suited to young children, for at least four reasons. (1) It is surely undesirable to deposit the day's dirt between the sheets! (2) Dust and dirt combined with the oily secretion of the skin can only be satisfactorily removed by the combined use of warm (or hot) water, soap and friction. (It is of real urgency, therefore, in the interests of health, that shower baths should be installed in elementary schools and the habit of regular bathing formed in early childhood. Thorough washing with soap and hot water ought meantime to be insisted upon before the use of public swimming baths; though the benefit in this case is extended to very few of those whose health is deteriorating from personal uncleanliness. The provision of hot water for use in school lavatories is another most desirable departure, in the interests of the formation of good habits in this matter of cleanliness). (3) A warm bath before bed is very beneficial for excitable or excited children; the blood is drawn to the surface of the body from the over-active brain, so that sleep comes more readily and is of a more refreshing character. (4) Moreover, few growing children possess sufficient vitality

to bear profitably the shock of cold water, especially before food in the morning. (Later on in life, under suitable conditions, it becomes an individual question whether or no such bracing measures can be well borne). It must be also remembered that cold water does not cleanse equally with hot.

Another detail of the toilet quite insufficiently emphasized is the care of children's teeth, which should be gently brushed daily with a soft brush, simple chalk powder, and lukewarm water, from the time when two teeth are cut in close juxtaposition; not merely to form the habit early, but because the preservation of the "milk" teeth in a healty state is of great, but too little recognized, importance. General nutrition, not to mention the future perfect development of the permanent teeth, depends largely upon the careful preservation of these first teeth from decay. Too few people understand that the constantly swallowed discharge from decayed teeth leads to dyspepsia, anæmia and other serious troubles. Mastication is imperfectly performed where teeth are tender, and the condition of the jaw does not permit the permanent teeth to develop normally. The public is curiously indifferent to this matter; yet it is rare to find a child of six without one or more decayed teeth, and in the majority, at twelve years old, some of the most important permanent teeth have been lost, or are in the last stages of decay, as a result of this disastrous carelessness. Observations on weight show that children with good teeth average about half a year ahead of children with poor teeth, a difference amounting to as much as 2½ lbs. per child. Calcification of the "milk" teeth begins long before birth; the first five years of life is the critical period for the calcification of the permanent teeth, nutrition and environment being the determining elements in a successful issue or a disastrous culmination.

Attention to the care and cleanliness of the nails of both toes and fingers, should be more constant and intelligent throughout childhood. Deformities of the feet interfere seriously with later activities, while delicacy of touch and manipulation is con-

siderably diminished by such neglect in early life. Reference must also be made to cleanliness of the hair and head. Reports from school doctors and nurses speak of the prevalence of widespread neglect, which prejudices health, destroys self-respect, entails risks to others, and reflects seriously upon those in charge of our children.

The close connection between bodily cleanliness and morality also claims consideration. Masses of our child population are reared with no training in habits of self-respecting decency, or in the necessary attention to the performance of daily functions with suitable regard to that propriety which the better-off child acquires unconsciously and practices as if by instinct. Unclean clothing is unquestionably a cause for the prevalence of at least one form of immoral habit, especially in the case of little boys. Their cloth, serge or fustian lower garments are very rarely, if ever, washed, and are often handed on for use from a generation of elder brothers or have been purchased second-hand. Local irritation is frequently caused by these filth-incrusted knickerbockers, and, quite unwittingly, an evil, debilitating and demoralizing habit is acquired in the effort to relieve discomfort.

Clothing throughout childhood should be invariably clean, easy, light, warm, and, if possible, elastic, in order to permit of free movements and of constant growth. Weight should be equally distributed, and the material should be, if possible, woollen, of various textures to suit the season and temperature. Counsels of perfection these, of course, when cheap, ready-made clothing is found in almost every family, made for the non-existent "average" child, where comfort is sacrificed to cost, ease to appearance, and suitability to social status. The non-conducting, hygroscopic, elastic, porous, non-inflammable nature of wool mark it out as *the* substance for children's clothing, whether it be used in the form of nun's veiling and Shetland wool for babies, or of stockinette under-garments and woollen frocks and suits for older children. It is to be hoped, therefore, that the fashion of "romp suits" for children (con-

sisting of serge knickers and knitted jersey, with the addition of a kilted skirt for little girls), now gaining ground among the well-to-do, may spread downwards to those who endeavour to adopt each fashion as it is set by the wealthy. In all cases, simplicity and cleanliness should distinguish children's costumes, whether in the interests of health, of symmetry, of beauty, or of convenience. A caution against overclothing their children is needful for some mothers, as is advice to others upon the due protection of little chests, legs and wrists.

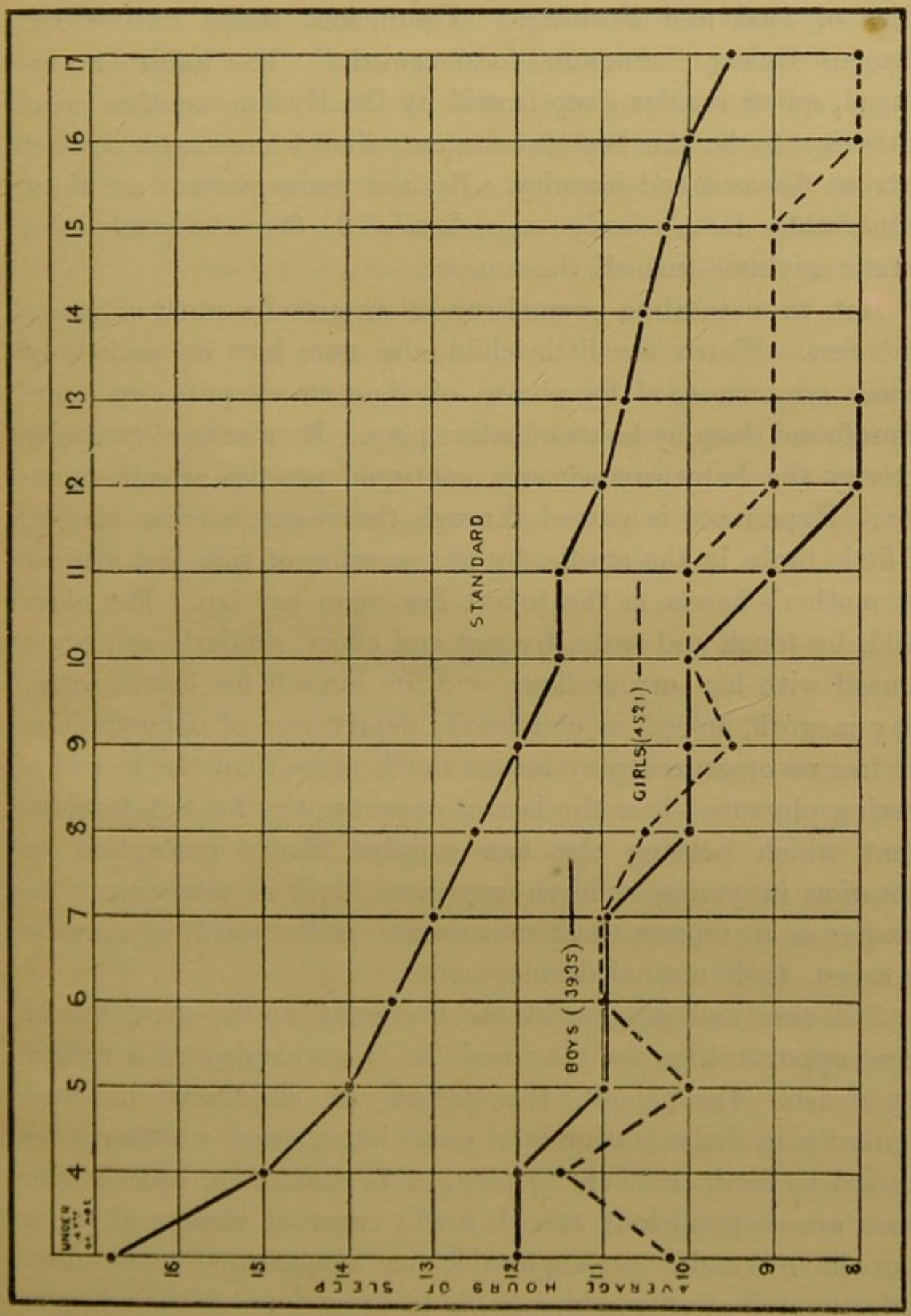
It should be scarcely necessary now to point out that light, air, and sunshine are as indispensable to the normal, vigorous growth of the human larvæ as to the product of our gardens and greenhouses, or that children suffer more severely than do adults from impure or insufficient air. Mention has been already made of the fact that two quarts of liquid daily is no unusual allowance for an active child from five to twelve years of age; but this quantity sinks into insignificance when compared with the daily consumption of air, which amounts, at a reasonable computation, to two thousand gallons. If this absolute essential to existence be furnished from impure sources, it is not difficult to comprehend how serious may be the results. Not that these are rapidly apparent; bad air may be described as a "cumulative" poison. Continued respiration of an atmosphere fouled by impure gases, laden with excess of moisture and organic impurities, thick with filthy dust, may be, and is, endured for years, frequently for an average life-time. The sufferers do not die, they merely endure myriad forms of quite unnecessary discomforts or delicacies, such as headaches, indigestion, rickets, rheumatism, colds, and general debility. Lowered vitality always predisposes to disease, and ailments thrown off by the healthy cling to these victims of impure air in some chronic form. Peevish restlessness, persistent fidgets, complete inability to concentrate attention, perverse appetites, constant colds or chills, represent the child's cry for purer air.

Abundant sunshine, freely admitted to every part of the

sleeping-room and school, is the best response to the cry, and when combined with open windows and attention to cleanliness, direct sunshine is the most efficient cleansing agent for the domestic atmosphere. But it must not be allowed to pour down on an infant's face as it lies flat in perambulator or cradle, and the heads and necks of small children, as they play about in the summer sunshine, should always be efficiently protected.

A factor of equal importance to healthy childhood is sleep; in later life, there is a considerable variation in the amount of sleep required by individuals, but the demand is practically uniform for children in each year of life. All authorities are unanimous in their opinion that from the twenty hours daily sleep of the infant down to the seven or eight hours rest of the adult the transition must be very gradual. Until nine years old, twelve hours on end in bed is none too long; and, until six or seven years old a mid-day rest, varying from one to three hours, should be considered almost as important. Eleven hours of sleep is still required by the rapidly-growing boy or girl of twelve, especially where body and mind are in constant activity; indeed the conventional hours of maturity could advantageously be postponed until twenty-one or thereabouts; any seeming hindrance to study or loss of pleasure being amply compensated by the exhilaration and vigour subsequently enjoyed by the well-refreshed sleeper. Investigations show that a serious deficiency of sleep exists among the majority of children at the present time; in many cases it equals one-fourth of the amount necessary during the whole period of childhood, while noise and other disturbing factors interfere with the beneficial influence of that which is enjoyed.

Sleep, it must be remembered, is a state of healthy unconsciousness, necessary to restore the energy expended in every moment of waking life; nerve force is stored up for the next day's needs; development and growth are promoted; power to maintain mental balance is acquired; strength to fulfil the vital functions is generated. Adequate rest is as essential to the



Average Hours of Sleep at different ages of 4,521 Girls and 3,935 Boys from infancy to sixteen. Results of an investigation by Miss Alice Ravenhill, F. R. San. I., among Elementary School Children in England, 1906-7.

This Diagram is reproduced by kind permission from the Transactions of the Second International Congress on School Hygiene, held in London, 1907.

growth of a vigorous population as are the more material necessities of food and clothing. "Insufficient sleep," writes Dr. Clement Dukes, "amounts to overwork." The habit of prolonged, quiet, regular sleep is said by Dr. Hyslop, another great authority, to be the best investment, almost insurance, against nervous diseases and insanity. By how many parents are these indubitable facts dimly apprehended? Our hospitals and lunatic asylums furnish the answer.

But, to maintain a normal condition, activity must alternate with rest. Watch the little child, and note how its periods of repose are succeeded by phases of vigorous exercise, its hours of profound sleep by hours of active play. By means of muscular activity the baby carries on a continual process of self-education. Experience is gained through the vague, aimless waving of little limbs in the cradle, by the pressure of tiny feet against the mother's hands, as the infant lies upon her lap. The older child, by touch and taste, by test and effort, similarly acquaints himself with his surroundings, and fits himself for future work. Play is work, indeed, in childhood; deprivation of opportunities for free or organized play means much more than the loss of a passing pleasure—it is the loss of opportunities for self-development which nothing else can supply. Every perception or sensation in young children expresses itself in movement; to hamper or to repress these movements is to retard, or may be to arrest, their normal development.

But care and judgement are necessary in the provision of these opportunities for play and for the widening of a child's experience. Throughout the period of childhood habitual regularity in daily routine is of great importance, whether it be applied to food, to sleep, to play, or to matters of toilet; late hours are as pernicious as rich food; constant change of scene may have results as deplorable as exaggerated monotony. Unfortunately, excitement is liable to be confused with judicious stimulation, and the modern child is taught to consider quiet, family life as dull and empty. The garden and field on fine

days, the nursery or kitchen in bad weather are brimful of varied interest and fascinating novelty to the normal healthy child, to whom that which is so familiar to nurse and mother is possessed of irresistible and ever fresh attractions. Among these homely, quiet scenes is found the type of stimulus adapted to a child's requirements; by their means he should be guided to satisfy his thirst for knowledge, to gratify his craving for activity, and his instinct for imitation. The home has developed in response to the needs of childhood; healthy well-ordered family life is its natural environment. That thousands of children to-day know no home life, and are reared in the noise, crowd and excitement of our artificial town existence, constitutes a source of keen anxiety to the thoughtful and the truly patriotic, who foresee the inevitable results upon the efficiency of the population and the stability of the State.

CHAPTER V.

GROWTH AND DEVELOPMENT IN CHILDHOOD.

Growth has been defined as the group of phenomena associated with increase of dimensions in weight, volume, and length. The details of the process are very complex, for different parts do not grow in the same way, in the same time, or in the same proportion; neither do the internal or external influences to which they are exposed bring about similar results.

Efforts have often been made to divide infancy and childhood into growth periods, in order to classify under these the signs by which they may be distinguished, and thus to facilitate the provision of those conditions which are indicated as favourable to each phase of development. For many reasons these attempts cannot be entirely successful, though the results are unquestionably suggestive. There must always be considerable diversity among children in the age at which stages capable of definition are attained; while inevitably these overlap and merge invisibly the one into the other. And this, too, among

members of the same family; for, though all conditions may be apparently identical, the factor of inherent, independent personality can never be overlooked. Individuality asserts itself throughout life; mental diversities of temper or faculty are more than parallelled by physical differences in the dates of dentition, of walking or of pubescence. Moral characteristics also, such as the period when power to distinguish between truth and falsehood, or to control self, comes into conscious existence, vary in the date of development.

It must be also borne in mind that growth has a twofold character. It may consist of increase in size or substance, or it may be apparent as development in capacity, in power, in ability to perform more complex acts. In some cases these two forms alternate; when rapid growth of body ceases for a time, the child's mind seems to throw out tendrils of intelligence in all directions, a phase succeeded by a relatively quiescent period for both mind and body. But, in the opinion of the most recent authorities, accelerations in height, weight, strength and mental ability also occur coincidently, so that there are good grounds for the belief that the more rapid the pyschological development the more rapid is the gain in weight, height and strength; it is possible, therefore, that, in the future, age will be estimated in terms of physiological development rather than of years. On the other hand, illness or repressive discipline, chronic conditions of starvation, overcrowding, or filth, precocity, premature responsibility or hard work, invariably retard and often check one or all of these forms of growth.

A rhythmic element in growth and development, bodily and mental, has been also detected and emphasized by some observers. Malling-Hansen has shown that in the autumn, when growth in weight reaches its maximum, growth in height is at its minimum; in the spring, on the contrary, the maximum increase occurs in stature, the minimum gain takes place in weight. Dr. Stanley Hall has drawn attention also to the rhythmic alternation traceable between increase in height and

in circumference of the chest. The curves of relative increase cross each other four times between the ages of ten and sixteen years and show that the normal body thickens somewhat before it lengthens.

Every form of growth and activity seems more or less subject to this law of periodicity. The good child is sometimes naughty for a while, the bright child stupid, the cleanly is dirty, the good-tempered becomes moody, the active will be lethargized, the stupid will belie his character. The development of the whole body, as well as of each individual organ, takes place with continual alternations of activity and passivity; a marked advance carries with it a succeeding period of reaction; fatigue, slovenliness, and dullness follow (in a greater or less degree), stimulation, enthusiasm, and progress; the whole rhythm being materially affected by surroundings, by race, by climate, by sex (growth is more rapid but less prolonged in girls), by age, by exercise, and, as has just been shown, by season. Growth in weight is more variable than growth in height and is much influenced by the physiological age and nurture of the child; efforts should be directed to the maintenance of a certain relation between the two factors in the interests of health.

Theoretically the increase in height of a healthy infant during the first year of life should amount to 40%; the total length at birth ought to be doubled about the fifth or sixth year, and should be tripled at fourteen or fifteen. The average baby will weigh about seven pounds at birth; but infants of three pounds are not unknown, and some proud mothers boast that their fine babies turned the scale at twelve pounds and even more. This weight should be trebled in the first year of post-natal life, it should be quadrupled at three years old. A well-nourished child should weigh at five years old five times what it did when born; at eight years of age this increase should be seven-fold.

Quételet considers the weight of the infant when new born should be multiplied by 9 at eleven years old, by 11 at thirteen,

by 15 at sixteen, and by 22 when physiological maturity is reached at twenty-five. Thus in the first two years after birth, an average child should gain twenty pounds in weight and ten inches in height, the chief increase being in the first year. In the third year, five inches is often added to height and five or six pounds to weight. From three to ten years of age the annual increase is about five pounds in weight and about three inches in height. Until the seventh year, as a rule, the height in inches exceeds the weight in pounds; from eight to twelve the height in feet and weight in stones usually corresponds; while as growth nears completion, a further increase in weight over height should occur. It is therefore evident that from birth to the sixth or eighth year growth is very rapid. Then there are several years during which progress is slow but steady; and to this succeeds a somewhat sudden advance, associated with adolescence. Slow growth in height continues in some individuals until thirty; and increase in chest girth goes on until fifty, after which the process of gradual involution reverses previous conditions.

It will be advantageous at this point to draw attention to certain physiological and mental characteristics, by which various periods of child development are more or less distinguished. The first stage of life, described as the infantile, has been already dealt with in some detail; its climax being marked by the completion of primary dentition. To the vegetative condition of the young infant, when its powers are almost purely receptive and immature, succeeds a period of restless activity alternating with deep sleep, during which, under the influence of warmth, food, cleanliness, and care, body and mind are nourished and strengthened. By means also of self-development through muscular activity the tiny creature acquires experience, and forms elementary conceptions of the world in which it is placed. The valuable faculty of imitation is intensely alert about the fourth and fifth years; the little monkey is constantly reproducing by voice, gesture and movement the sights

and sounds which perpetually attract its active observation. Impressions received during these years are practically ineradicable; it is the age for habit-formation along a hundred lines; and the injury inflicted on the susceptible organization where this plastic period is spent among undesirable surroundings, or under the charge of careless, ignorant guardians is incalculable.

Not that their responsibility terminates with infancy. In the succeeding period of early childhood, which embraces the years from four or five to nine, the child is intensely eager to see new sights and to make acquaintance with what to it are novel conditions; its naive ignorance rendering it incapable of estimating values or of making choice between what to accept and what to reject. Feelings are acute and intense; and, though physical development is good and power to do progresses, susceptibility to infectious disease is very great, and the period of second dentition is usually associated with a recognizable degree of nervous instability, probably attendant upon a somewhat marked phase of physiological development. The child of eight is frequently unequal to the physical fatigues he sustained at six, nor can he always bear the mental exercise which he enjoyed at seven.

More or less systematic habits of mental work should be in process of formation during this period, for at six years old ten minutes only of actual schooling twice a day does not spell loss of time; the active-minded child is learning all day long, and the three R's are far more readily acquired after the mental development, characteristic of the seventh and eighth years, has prepared the brain to begin book work. Until then, education should be directed rather to the formation of good habits, and to the training of eye and ear to observe accurately and to co-operate loyally with body and mind.

During the succeeding years from nine to thirteen, sharper distinctions than hitherto appear between the boy and girl. The incessant restlessness of childhood gradually disappears; the powers of reasoning develop; the memory is stronger than

at any other time of life, and the beginning of manual skill is marked. This is pre-eminently the time for steady physical and mental work, provided that it be adapted to the capacity of the scholars, while organized games and competitions attract and exhilarate. But the power of self-control needs careful cultivation, and a surprising disparity exists between desire to do and ability to achieve.

The fourth period, from thirteen to seventeen, is replete with changes—physiological, moral, and mental—of such moment that a separate chapter is devoted to their consideration.

It may be that to some readers these generalizations will appear too vague to be helpful, too extended to permit of being focussed into useful principles for direct guidance. The reason is not far to seek; the types of individual temperament from which they have been deduced are of such infinite variety, are characterized by such intricate complexity, that close definition becomes impossible.

For general purposes children may be classified into four groups of temperaments:—(1) the Motor child, (2) the Sensory, (3) the Neurotic, and (4) the Abnormal; though no hard and fast line can be drawn between any of these; and any detailed study of their characteristics would demand their subdivision into many sections. The tendency of to-day is in favour of assigning a physiological basis for the most prevalent types of temperament, and recent writers, such as Mosso, hold that character depends chiefly on the stability, or the reverse, of the nervous system.

(1) The Motor child is usually energetic and impulsive, affectionate and demonstrative, often rather self-conscious and domineering, full of questions, quick to jump to conclusions, possessed of a good memory, but prone to act rashly and to answer without thought, essentially generous and loveable, in fact, an attractive person when wisely controlled.

(2) The Sensory child is much quieter and less mercurial; a listener and learner; cautious, contemplative, shy and often

undemonstrative ; a little morbid perhaps and emotional. Such a child prefers to follow rather than to lead, is inclined to be sulky, and to commit acts of premeditated rather than of spontaneous disobedience.

(3) The Neurotic child has been defined as the victim of a more or less faulty nervous system. The flaw may be looked for in the form and structure, in the growth or in the nutrition of the nervous system (*e.g.*, in the offspring of tainted, alcoholic or exhausted parents), or it may exist in its irregular working consequent upon absence of control or a bad environment. The neurotic child is readily fatigued, intensely excitable, painfully self-conscious, fidgetty, liable to be carried away by a too romantic imagination, unable to concentrate attention, and showing usually an excess of exaggerated, purposelessly repeated movements of fingers and eyes, some of which assume the forms of nervous twitches and " tricks," as well as corrugation or overaction of the frontal muscles. Nevertheless, some of the world's greatest geniuses have sprung from the ranks of these neurotic children, and encouragement is to be derived from the fact that they usually respond well to intelligent handling, deriving great benefit from suited food, outdoor life, regular habits, and a kindly, judicious training in self-control. The " precocious " child belongs to this group of unstable nervous systems, and a word of warning should be given to parents on the importance of " levelling up " the less developed sides of such a character, rather than of accentuating its want of balance by stimulating its precocity. Our most reliable authorities on mental hygiene have pointed out that exaltation of some one function, such as is often present in these children, is the invariable precursor of loss of function ; and few are ignorant of examples of the bitter disappointment which has followed in such cases, the too early, the too rapid, or the too severe taxation of the mental faculties.

(4) The Abnormal child. In this group would be included all those cases which vary between very slight, almost imper-

ceptible, mental defect and obvious idiocy. Of these, a fair proportion *could* develop under favourable influences into decent members of society, and others whose condition is the outcome of adenoid growths, defective sense-organs, or poor nutrition, could, if their condition were early recognized and appropriate treatment were secured, take their places in the ranks of the normal. Whether nature or nurture is responsible for this condition is not yet satisfactorily settled; but three classes of causes have been identified, namely, those acting (*a*) before, (*b*) at, and (*c*) after birth. Among the latter may be mentioned a fall, a fright or shock, affections of sight or hearing, dirt, starvation, and illness; when a child, attacked with some disease which would otherwise be mild, is in unwholesome surroundings, the brain is one of the first organs to suffer.

The public should be better informed than it is concerning certain common physical signs of mental deficiency. For example, a low standard of intelligence is usually, if not invariably, indicated when the circumference of a child's head is not more than 19 inches at seven years old, or when it is excessive in its size; *e.g.*, when the circumference amounts to 28 inches, a deformity which is sometimes a sign of rickets. The skull may be bossed; the forehead narrow, or hairy, or shallow, or bulging; the ears are often asymmetrical, ill-formed, outstanding, or coarse and red; the nasal bones may be wide, sunken or indented. The palate may be cleft, or narrow, V shaped, arched or vaulted; the features are frequently coarse, heavy, flat, or out of proportion, *e.g.*, the mouth extremely small. The growth may be stunted and dwarfish, and the general balance of the head and body is usually irregular; the hands are often blue and cold, generally weak or nervous in their balance, with incurved little fingers. The eye movements of such children, by their wandering irregularity, illustrate the common law that excessive movement indicates weakness not strength; response in action and motor control is, as a rule, poor, and very often speech is defective. Sexual tendencies are prone

to develop precociously in some of these cases, and "phobias" or morbid fears of different kinds, are often present. Perhaps the most difficult cases to identify are moral defectives; children who probably bear all the signs of physical well-being, but in whom exists no capacity for self-restraint and no sense of truth; who taint the atmosphere with moral infection.

Dr. Shuttleworth enumerates ten classes of the slighter forms of mental defect or abnormality in children, which necessarily influence growth and development, but which, by careful diagnosis and judicious treatment, could be prevented. As Dr. Robert Jones has recently estimated that one child in each one hundred and twenty is affected with some form of mental defect, the importance of an early recognition and prompt treatment of these cases becomes self-evident.

Approximating closely to the feeble-minded, are the dull and backward children, whose symptoms may be the result of removable physical causes, or of a low degree of mental development, or of a want of development in some comparatively limited tract in the brain, from which, for example, word blindness in some one or other of its forms, may follow. The recognition by Dr. Kerr and others of the subtle results of physiological variations in comparatively small anatomical areas, and of the misleading inferences to which observers have been prone from want of fuller knowledge of their intricate effects, is relatively recent, but promises to be of major importance to the sufferers. In all these cases, the provision of a special form of education can do much to foster development along normal lines, while some acquaintance with the characteristics of growth and development in the healthy child, and some power to detect the stigmata of degeneracy in the unhealthy, will assist in the early recognition of deviations from the normal and will stimulate efforts to secure expert advice and direction for the abnormal.

CHAPTER VI.

SOME EDUCATIONAL NEEDS OF CHILDHOOD.

It has been pointed out that there are three avenues of approach to the scientific study of education—the physiological, the psychical, and the sociological. The first is concerned chiefly with the healthful development in due order of the body and its parts, and with the provision of such surroundings as shall secure opportunities for the right functioning of the corporeal systems. The second is more directly concerned with mental training; with the judicious stimulation of nascent abilities, with the formation of good mental habits of attention, concentration, observation, eager acquisition, and intelligent application. The third road has been traced by those who first recognized the fact that childhood is the period during which the organism is designed to adjust itself to its environment; therefore, they maintain that schools for children of all ages should be so planned as to offer a genuine form of active community life to their young clients; they should be the anvils whereon life-long links are forged between home, school and country. Naturally, these avenues converge to reach their final goal, and cross and recross at many points throughout their course—for each and all of the features by which they are characterized constitute a desirable element in a sound system of education;—if, that is to say, the characters and conduct of its products in the prime of their lives are to be possessed of their full physical, moral and economic values.

The process of education starts with birth and continues throughout life. Even in the first twelve hours of a baby's existence an experienced nurse will inculcate, though often unconsciously, her first lessons in the science of right living; for this early education is primarily concerned with the important process of habit-formation, proceeding in each case along slightly

divergent lines, which become accentuated as the child passes from infancy to maturity.

It is, perhaps, legitimate to describe children in these early years as little pieces of correlated machinery, which machinery is then especially easy of direction; so that life-long habits can be systematically cultivated in respect of sleep and scrupulous cleanliness; of decency, order, candour and unselfishness; not omitting some training in due attention to the care of physical functions, or in the enjoyment of intelligent play and the development of a sense of social obligations.

Habits have been accurately defined as things which "have" us; acquired with ease in infancy, they cling with limpet-like tenacity throughout life.

Experience demonstrates that they are best formed by the guidance and control of mind and body through their ordinary activities, with the assistance of appropriate stimulus. As all growth is a unity, wholesome physical conditions are the first necessity to the acquirement of a high moral standard. For instance, a proper supply of varied food enables a strict veto to be laid upon the purchase and consumption of "tuck"; many other somewhat similar trains of thought and action can also easily be made habitual; for the scope of hygienic discipline and of moral training includes and demands the harmonious co-operation of the whole being—body, mind and spirit.

All training should, so far as is legitimate, be positive and constructive in its methods; not negative and destructive. Too many children lead painfully "don't-bounded" lives. Discipline means rather the wise direction of activity than its ignorant repression. Children are ready enough to hitch their little waggons to the star of high ideals, but their aspirations so far exceed their capacity to achieve, that constant encouragement is needed in order that they shall habitually think on that which is pure and speak only of that which is of good report. Patience and tact are very necessary when dealing with little folk

whose apparent misdemeanours are often the unintentional outcome of narrow experience and of physical immaturity. The power to perform an action, for example, invariably precedes, sometimes by a considerable interval of time, the power to control it. A small child can learn to shut a door before its nerves and muscles are sufficiently co-ordinated to close a door gently; or a cup of water can be carried across the room before skill to prevent the spilling of its contents has been physiologically acquired.

Twentieth-century children are blissfully ignorant of all they owe to Frœbel, but it was he who so successfully explained and emphasized their characteristics, that a portion, at least, of their governors, pastors and masters are now alive to the true significance of their mercurial activity, the repression of which arrests development; to their faculty of imitation, which demands that only that which is wholesome should be offered for this purpose; to the pathetic dependence, which leaves their innocent souls and bodies at the mercy of those around them. It was Frœbel who indicated an ideal, a position, a training, for the child population of the world. It was Frœbel who took for granted that the earliest and most impressionable years of life would be spent in the shelter of a loving home; and, therefore, assumed that all mothers would esteem it at once a duty and a privilege to teach life's simplest lessons to the children on their knees.

The industrial and social changes which have occurred since Frœbel's day have brought about results of very questionable benefit to young children. The claims of work on the parents, whether professional, social, philanthropic, or industrial, have led to the delegation of their trust to nurses or other less suitable persons, and have contributed to the premature school attendance of many children. Thus, the tender maternal bond is weakened, and an undue stress is entailed on the little scholar; a form of stress, a precocious responsibility, which tells rapidly on delicate or fragile children; so that weak points in the con-

stitution, which might otherwise be gradually strengthened, give way under the strain, with long-enduring results to the individual, not to mention future disappointment and economic loss to his family and to the State.

The loss of weight which has been conclusively proved to be associated with the first weeks of school attendance may be only temporary, but its incidence points to a serious flaw in our educational machinery and to an assumption of a responsibility in making or in encouraging provision for these little children, which involves grave issues. All parents and guardians should test the success of any educational system to which the children under their charge are subjected by intelligent and constant observations on weight and other physical phenomena. By a clear, healthy skin and a wholesome appetite, in the good balance of body and by a lively expression of face, satisfactory assurances are given of normal well-being. Physical vigour and brain activity are indicated, until nine or ten years old, by much spontaneous movement and flow of happy chatter; the child's bright eyes are eager to discover all that the world has to offer of interest and of fun; the firm muscles speak of constant natural activity and wholesome nutrition; prolonged, quiet and profound sleep points to healthful fatigue and real recuperation of energy.

Where there is unusual excitement or unnatural silence, abnormal lassitude or fretful fidgets; heavy eyes; distaste for food; loss of weight or restless sleep—wise parents recognize danger-signals, urgent and not to be neglected.

Close concentration upon studies from which interest is absent because the mind is weary, or mental dyspepsia and debility following upon the ingestion of too many new facts or theories, is worse than a parody of education, it is a moral tragedy. Habits of mental immorality and the stigmata of physical deterioration are acquired with fatal facility under such conditions.

Unfortunately, compulsory repetition of mechanical pro-

cesses or of prescribed movements seems to be inevitable where disciplined exercise of either mind or body has to be pursued collectively, but it stunts and deadens the young organism, and fails to develop and stimulate the intellect. Each sense and activity demands adequate stimulus at the period when ripe to function, but stupidity, obstinacy, fatigue, and even actual injury, are the invariable results of receiving too many impressions or of unduly prolonging either mental or physical exercise. Especially serious is this risk with school "infants," unless means are afforded to react to the stimulus by some appropriate activity, or to relax the attention when exhausted.

Take for instance, learning to read. Deterioration of sight is conclusively proved by medical experts to result from premature and prolonged concentration of immature eyes upon printed matter or small objects. All young children are normally long-sighted, that is, the eye sees without effort objects at a distance of from 18 feet to 20 feet. The organ of vision needs some years in which to acquire the power to adjust its parts to see objects clearly and continuously at a short distance, especially when these are small. In the effort to do so for more than a very short period the plastic tissues suffer permanently as a result of the muscular strain, the eyeball is pulled into an abnormal form, and the owner is condemned—often after much needless worry and discomfort—to a spectacled future. No fine, finnicky performances should be permitted; but the reproduction of broad, bold, simple objects should be encouraged, attention should be directed by degrees to differences of detail, and intelligent observations required of nature's methods and models. If the reading process be postponed for three or four years until necessary development has taken place the power will be far more rapidly and readily acquired.

Instead of concentration on any form of near work, these early years can be devoted with much profit to introducing the child to his environment, and to the inculcation of good

habits in respect of cleanliness, mastication, decency, obedience, and courtesy.

From about the age of four years and right through school life development is assisted, control of material is acquired, acquaintance with environment is encouraged, and welcome change of posture is ensured, by the generous introduction of suitable forms of manual occupation into the child's daily doings. In the sand-pile and sand-tray, in plasticine and wooden blocks, in coarse wools for weaving and gaily-coloured papers for plaiting, in blackboard and chalk, the little child finds material for a wealth of experimental efforts. Toys, games, and free play, as well as ample opportunities to eat and sleep as nature directs, should also bear a prominent part in the nursery school programme. This note is being happily struck in some infant schools to-day, though large classes and limited space can never permit its real value and educational possibilities to be perceived and employed. While initiative and self-help are thus encouraged, example and precept should stimulate ambition, and secure steady progress towards accuracy and complexity.

The constructive faculty, as well as the power to apply knowledge as it is gained, and the exercise of judgement, demand cultivation in the senior as well as in the junior grades of every school. The manipulation of iron, wood and clay, the judicious pursuit of the practical domestic arts, as well as of gardening and kindred interests, should all be employed to serve these ends. Dr. Thomas has ably pointed out that "the crusade for physical efficiency cannot rest content with the acceptance of the gospel of coarse physical training; it must demand a still greater amount of attention to the fine muscles, which are the especial organs of brain architecture." Discipline, attention, and happiness all accompany this educational training of hand and eye.

Too much emphasis can scarcely be laid upon the fact that the incessant activity characteristic of early childhood is instinctive, and cannot prematurely be coerced into a semblance of

adult quietism and self-control without prejudice to the child. The process of unintelligent repression is as physiologically wrong as is that of insisting upon accurate manipulation of fine pens and needles by little fingers, unequal, from want of brain development, to perform their allotted task.

Each moment, in the healthy child, some new posture or some experimental effort co-ordinates brain and muscle, and promotes nutrition. Before the age of six or seven obligatory mental concentration or compulsory inactivity of tongue or limbs for more than a very few minutes, and these at considerable intervals of time, is not beneficial, but detrimental, to nutrition and growth. Regulated activity, not artificial immobility, should be the key-note of all educational intention for the first ten years of life, and the order of natural development, so far as it can be traced, should be faithfully followed. There is also no want of unbiased evidence available to show that, with children of older growth, judiciously conducted lesson periods of shorter duration than is at present conventional in this country are remunerative in the highest sense.

Close concentration for reasonable periods is a splendid mental discipline with older children, and is permissible where only legitimate demands are made on still immature brains; the results of concentration are of enduring value and act as a stimulating moral tonic; but such mental effort is not adapted to those fagged out by excessive physical exertion, neither should it be required of the debilitated, or of those convalescent from recent illness.

About an hour and a half is long enough for a child of eight to spend daily over what are commonly called lessons. At ten the limit should be set at about twice that length of time, four hours of book work is ample for the twelve-year-old, and these should rarely be exceeded at sixteen. Sufficient variety, too, must be provided during these hours. The child's brain is not fit for the spells of prolonged study so congenial to many adults. Whatever the type of occupation, one long period of sustained

work is far more exhausting to a child than the same, or an even greater amount of time, split up into portions separated by considerable intervals.

Periods of relaxation, too, should follow the more exacting lessons, and Time-Tables need revision in the light of recent studies of the mental fatigue associated with particular subjects or special periods of the day. Carefully conducted tests carried out in Germany, Sweden, the United States, and Japan confirm the observations of experienced teachers in this country, namely, that one hour of afternoon school work causes more fatigue at any age of school life than do three morning hours. The fatigue attendant upon properly performed "physical" exercises, also appears to equal, if it does not exceed, that associated with mathematics, physics, or other exacting subjects.

So soon, also, as the periods of free play are curtailed by specified school hours, and the physical condition of repressed activities is further complicated by close rooms, constrained posture, and mainly mental exercise, attention must be given to physical training; not with the idea of creating a generation of Sandows, but to ensure just that standard of personal health which is the birthright of every child. Power to respond accurately and promptly to commands is the indication that the brain is ripe for the first step towards the scientific training of the muscular system. This stage is reached usually about seven, though a wide margin must be left for individual variation. Prior to this period, a child will imitate movements, but cannot naturally or advantageously perform them to order.

Physical education aims at promoting the normal growth and development of every part, at fostering the healthy action of every function. Its results are anatomical, physiological, mental, and moral, its objects are at once rational and national. *But* the pupils must work under fair conditions, for physical education means brain work as well as muscular exercise; it calls for abundant fresh air at the moment and a subsequent period of "going easy."

Under no pretext whatever, must organized physical training be allowed to replace recess. It is true that physical exercises secure variety of posture, and give aim to restlessness; but they also claim instantaneous obedience to order, call for observation, discrimination, discipline, and self-control, not to mention the demands they make on endurance and perseverance. Now the chief use of recess is the complete suspension of will tension and the recreative surrender of self to caprice for a short interval, a most necessary form of interlude between the lessons of a school session. The moral value also of training in the intelligent use of leisure must not be discounted, if the individual is to be equipped at maturity to start upon and to conduct wisely his own independent career.

CHAPTER VII.

THE PLACE OF PLAY IN CHILDHOOD.

The gradual growth of an intelligent concern for the interests and capacities of childhood has resulted in a heightened educational appreciation of the significance of play activities. It is now recognized that, for a series of years, play is the absorbing aim of existence, indeed life is virtually controlled thereby, and for this some good reason must exist.

Spontaneous play may be described as a kind of experimentation, common to young animals, human or otherwise, by means of which they acquire a large *répertoire* of co-ordinations, which later on will be utilized intelligently in the struggle for existence. Close observers of child-life have endeavoured, for centuries past, to account for the potency of the play instinct as well as for its prevalence. That it possesses direct educational value was recognized by Plato and Aristotle, but this insight into its true intention received little general acceptance until the age of Frœbel and his successors.

What is known as the "common-sense" explanation of play was, and with many still is, a popular mode of accounting for its prevalence. Play represents to its supporters a natural overflow of physical energy, occasioned by the periodical discharge of superabundant vigour characteristic of extreme youth. The direct benefit to nutrition associated with the more rapid circulation through the tissues of the blood and lymph, and the formation, as an outcome of its characteristics, of new paths of association in the brain, points, in their opinion, to the physiological basis of play activities. A further argument in support of this theory is grounded on the conviction that play affords that welcome change of occupation by which exhausted powers may find rest and recreation, and the varied forms assumed by spontaneous play are accounted for, though, as reflection will show, inadequately, by the child's innate imitative faculty.

It is now known that change of activity or of occupation is *not* recuperative; that to eliminate the toxic fatigue products from the tissues, rest, relaxation from any form of activity, is necessary. Neither does the theory of imitation satisfactorily account for the inherited impulses towards prescribed reactions in certain brain tracts, which are easily discernible by intelligent observers of the play of very young children. For example, the movements employed in the games of Bo-peep or of Fisticuffs, which usually represent the infant's earliest social plays, are employed long before its experience has embraced efforts to evade capture or to protect self by fighting.

The more scientific conception of the origin of the play instinct is that based on biology, for this provides the general principle, applicable to the whole of life, which is demanded by its enduring importance. The supporters of this theory maintain (1) that the play instincts furnish initiative for certain activities essential to the life of the organism, which instincts, coupled with imitation, protect the animal, until intelligence is ripe enough to bring about the necessary adaptation to environment; (2) that in the simple play of early life can be

detected the gradual elaboration of immature capacities to a full equality with the instincts perfected at birth. Hereditary qualities are thus evolved to a state of adaptability and versatility essential to the functioning of the higher mental powers; for at this period in man's history, when he has so far progressed that intellect accomplishes more than instinct, these fundamental, hereditary instincts are liable to remain in abeyance, and thus to lose their value as a stimulus to higher development. In order to preserve this foundation of rudimentary functions, without which the stability of the superstructure of intellectual progress is prone to suffer, the necessity for the "chiselling out" of brain predispositions by means of individual experience gained through play, assumes a more and more emphatic importance.

The theory that the child rehearses in his play the history of the race cannot, of course, be pressed too closely, but the genetic explanation that the impulses to experiment, to fight, to chase, to domesticate animals, to construct, to devise methods of gaining ends, are hereditary, and call for expression as a preliminary to the development of acquired characters, is supported by strong arguments and by many facts. According to this theory, free play in childhood prepares for adult existence, by affording opportunities to exercise the imagination, the reason, the will, and the attention, by training in the endurance of pain and disappointment and in the utilization of quick wits and of ready resource. Karl Groos declares that there must be childhood in order that there may be time for play; for if the creature is is to be responsive to new conditions, his play instincts and imitative faculty must have a fair field.

This opinion that play is a definite preparation for the serious life of adult years, and that, when free and spontaneous, it recapitulates, to the enormous benefit of the child, the activities of primitive man, is leading to a revival of interest in games as well as to a greater tolerance of childish instincts.

Writers on the subject of toys and games dwell upon their

general resemblance throughout the world and to their remarkable permanence; the majority, indeed, have survived where languages, dynasties, even religions, have passed from man's ken. Culin points out that games, such as Hop-Scotch or the Tug-of-War, are survivals from primitive conditions, under which they originated as magical rights and means of divination, and Professor Haddon asks how many boys, as they whirl their buzzers or hummers, realize that they are playing with the secularized survival of what was once an instrument in the celebration of magical practices and of religious rites. The movement to trace out, and to preserve in permanent form, many of these heritages of the past is worthy of all support. The reintroduction of traditional games and of national folk-songs and dances into our schools should serve a double purpose. It will preserve much that is of ethnological interest and it will furnish play fare for our children such as is suited to their years, as well as providing for their pleasure what is social and civilizing in its influence.

The temptation to enlarge upon the educational and social values of play is strong; but perhaps more immediately profitable will be an endeavour to indicate briefly the characteristics of play by which various age periods are distinguished, and to suggest certain considerations in connection with their wise recognition.

A selection of the activities more or less prominently associated with the first twenty years of life, has been grouped into five "Play Periods," here presented in tabular form; an arrangement which facilitates their illustration by a selected, but very far from exhaustive, list of some of the games and toys through which experience shows they may find appropriate satisfaction.

BABYHOOD 1—4 YEARS.
Age of Simple Social Play.

Activities.

Free Bodily Movements.
Foot and Finger Plays.
Touching, Pounding.
Dropping, Rolling, Rattling.
Pushing, Creeping, Fondling.
Splashing, Shaking.
Climbing, Rocking.
Exploring.
Imitating.
Walking and many Rhythmic Movements.

Examples of Toys.

Smooth Stones, Sticks.
Spoons, etc.
Blocks.
Balls.
Rattles.
Rag, Wool, or Rubber Dolls and Animals.
Picture-books.
Sand and Water.

Examples of Games.

Bo-peep.
Pat-a-Cake.
This little Pig went to Market.
Ride-a-cock horse.
Ring-a-Ring of Roses.
Finger Plays.
Dancing and Singing.

EARLY CHILDHOOD 4—6 YEARS.
Age of Individual Play; Interest in Control of Body.

Activities.

Touching, Examining.
Running, Jumping.
Climbing, Hauling.
Cutting, Drawing.
Swinging, Tossing.
Building, Digging.
Throwing, Catching,
Experimenting.
Collecting, Hoarding.
Games with Music and Songs.
Rhythm Plays.
Make-believe Plays.
Story-telling.

Examples of Toys.

Blocks, Tin Cans, Stones, Sticks.
Balls, Beads, Windmills.
Musical Toys (whistle, pipe, mouth-organ, drum, trumpets, etc.).
Dolls, Toy Animals.
Carts, Reins, Whips.
Swings, and facilities for Climbing and Sliding.
Soldiers', Sailors', Fireman's, Postman's, Car-Conductors' Equipments.

Examples of Toys—*continued.*

Rocking-horse, See-saw, Swing.
Picture-books.
Chalks and Blackboard.
Pencils, Paper, Paints, Clay.
Sand, with Pail and Spade.
Scissors, Paper, etc.
Collecting Simple Objects.

Examples of Games.

Ball Games.
Hide and Seek.
Dropping the Handkerchief.
Round the Mulberry-bush.
Hunt the Slipper, etc.
Dancing.

CHILDHOOD 7—9 YEARS.
Age of Intelligent Play; Interest in Control of Environment.

Activities.

Climbing, Running, Chasing.
Jumping, Throwing.
Balancing, Swinging.
Tumbling, Sliding.
Wrestling, Shooting.
Skating, Swimming.
Imitative Plays.
Constructive Plays.
Care of Plants and Pets.

Examples of Toys.

Sand and Clay.
See-saw, Swings.
Climbing- and Skipping-ropes.
Stilts.
Carts, Wheelbarrows.
Garden-tools.
Bows and Arrows.
Kites, Pop-guns.
Balls, Marbles.
Reins and Whips.
Dolls and Dolls' Houses.
Stables, Ships, etc.
Toy Weapons, Musical Instruments.
Insect-nets, Fishing-nets, etc.
Materials for Dressing up.
Keeping Shop, etc.

Examples of Games.

Hide and Seek.
I Spy.
Puss in the Corner.
Tom Tiddler's Ground.
Drop the Handkerchief.
Follow my Leader.
Hop-Scotch.
Honey Pots.
Cat's Cradle.
Riddles and Puzzles.
Ball Games.

LATER CHILDHOOD 10—12 YEARS.
Age of Competitive Group-Games.

Activities.

Dramatic, Imitative, and Constructive Plays.
Running, Racing.
Cycling, Riding.
Swimming, Rowing.
Climbing, Wrestling.
Skating, Archery.
Jumping, Throwing.
Gardening.
Making Collection of Stamps, etc.
Miscellaneous Games, involving a trial of the Mental Powers.

Examples of Toys.

Pets.
Balls and Ball-Games (marbles, cricket, hockey, etc.).
Dolls and good Model Toys (ships, soldiers, engines, dolls' houses, and furniture).
Kites, Hoops, Tops.
See-saw, Skipping-rope, Stilts.
Parallel Bars, Giant-stride.
Lotto, simple Card Games.
Puzzles (mechanical, geometrical, etc.).
Collecting Stamps, Pictures, Seeds, etc.
Chalks and Paints.
Sewing, Embroidery, Beading, etc.
Sand-pile, Clay.
Card-modelling, Paper-work.
Carpenters' Outfit.
Printers' Outfit.
Sloyd-work, Fretwork.

Examples of Games.

Ball Games.
Prisoners' Base.
Fox and Geese.
Bull in the Ring.
Follow my Leader.

Examples of Games—*continued.*

Hare and Hounds.
Flags.
Leap-frog.
Skipping.
Charades, Forfeits.
Cricket, Football.

ADOLESCENCE 13—18 YEARS.
Age of Cooperative Group-Games.

Activities.

Ball Games.
Athletic Exercises (races, jumping, etc.).
Swimming, Riding, Cycling.
Rowing, Sculling.
Dancing.
Cards and other Games of Chance.
Miscellaneous Intellectual Games.

Examples of Apparatus.

Balls, etc., for Cricket, Football, Hockey, Tennis, Basket-Ball, Lacrosse, etc.
Cards and Table Games, Dice.
Outdoor Gymnasium and Playing Fields.
Workshop Equipment.
Fishing Tackle, Aquarium.
Facilities for Manual Training.
Materials to satisfy Constructive, Artistic, and Intellectual Interests.

Examples of Games.

Cricket.
Football.
Hockey.
Tennis.
Basket-ball.
Lacrosse.
Croquet.
Boxing, Wrestling.
Charades, Tableaux, &c.

Those in charge of children are advised to supplement these few illustrations from some of the useful books now available for the purpose, for children are strong conservatives; they are imitative rather than inventive in their group-games, and need to be incited at intervals to the acquirement of new forms. But while supervision and suggestion are desirable, a due respect must be shown for the salient characteristics of each age period. To the aimless activities and simple social plays of early infancy succeeds the individual play of the small child, who is, as a rule, engaged in the serious work of self-education as he plays with

an empty tin and a bit of string or experiments in building-construction with sand or clay. He is not ripe for organized play until he has gained, through practice, some control over his muscles, and has tasted, touched, and handled for himself.

Provision for individual play should be as prominent as provision for restful sleep in Nurseries, Kindergartens, and Infant Schools. The time for co-operative and competitive games comes later on; when the moral sense, the intellectual capacity and the social spirit are more highly developed. Co-operation is essentially a work factor. So soon as play ceases to be spontaneous, it ceases to be "free" and becomes work; therefore, play performed to order loses its most salient characteristics. The pleasure-giving element must be present, and there are some who hold that, in its calls on the imagination, in its conscious self-deception, in its severance from life's serious aims, exist most important features of true play.

Another sub-division of games is also suggestive; here the groups are concerned with:—

(1) Bodily games, which exercise strength and agility.
(2) Sense games, which exercise the eye, the ear, the senses of touch, taste, or smell.
(3) Mind games, which exercise the mental faculties of thought, judgement, memory, reason, etc.

The almost imperceptible gradation by which the forms of play chiefly concerned with the development of muscular co-ordinations merge into those in which mental gymnastics predominate, has been well brought out by Superintendent G. E. Johnson in the Pedagogical Seminary for 1894.

The "Curves" of play interest among our English children at various ages, call for more study, if the full value of play is to be utilized. To concentrate the play energies of small boys of seven and eight, for instance, upon football and cricket, or of tired girls of twelve and thirteen on hockey, shows an ignorance of child needs as profound as that of the mother whose puny infant is starving on a diet of bread, butter, and beer.

Intelligent observation of children at play will also throw useful light upon physical and other powers; *e.g.*, the observer can note in what degree readiness to react to varied forms of stimulus, is present, what accuracy is shown, what grace or clumsiness, what strength or weakness either of mind or body. Does a child show persistence in action, or does he readily withdraw from his companions or desist in his efforts; can he adapt his expenditure of force to the amount of energy called for by any particular movement; is he sociable, gentle, and considerate, or a bully and coward; can the moody and morose be drawn into the social net by fostering a community of interest in "hobbies"; are the cruel and selfish susceptible to an appeal to the sympathies and emotions by means of pets and toys.

In conclusion, in what way can suitable opportunities be secured throughout childhood and adolescence for the exercise of free, self-originated activity in play; by what means can the public be impressed with the fact that to unduly restrict spontaneous play or to unwisely coerce the instinct into unsuitable channels is direct interference with the normal development of physical and mental capacity, and can result only in irreparable loss to the individual and to the community.

CHAPTER VIII.

SOME CHARACTERISTICS OF ADOLESCENCE.

The duration of this period of rapid changes, when the lines of development take a new direction, is far more prolonged than is habitually realized. It is also associated, in the majority of cases, with a considerable amount of mental perturbation, as well as with a tendency to certain physiological disturbances of the nervous, circulatory, and digestive systems, usually of a transient character, but nevertheless requiring intelligent attention. Its onset is influenced by climate, by race, by heredity, by nutrition, and by constitution. It seems to begin

earlier with inferior races and to be postponed as civilization progresses. But in this country, its characteristic indications may be looked for from the age of ten and upwards in girls and a year or two later in boys, while the period concludes between the ages of twenty-one and twenty-five in the case of the former, but often extends with the latter until towards twenty-eight.

Essentially it is a period of unrest, of exuberance and instability. The individual is born again, as Rousseau says, into a new life, emotional, intellectual, moral, and physical. Feelings are intense, but usually short-lived; langour alternates with energy; a craving for sympathy struggles with intense reserve, resentment at any semblance of control co-exists with an often times ludicrous, were it not pitiful, incapacity for self-direction; the missionary spirit may be strong, yet selfishness may be pronounced. Whether the product of this active fermentation shall be wine or vinegar, depends mainly upon early education and concurrent environment.

Perhaps more patience would be shown towards the subjects of this adolescent storm and stress, and more significance would be attached to its danger signals, were the enduring importance of some of the symptoms and the transitory character of others better understood. There is also good reason to believe that certain phases of development, such, for instance, as the first and second dentition, and puberty, mark periods of arrest in the progressive evolution of much older races, when there was a pause for a while, during which, instincts and habits were firmly formed and established, no further physiological steps being taken until a strong stimulus was exercised by some fresh and potent influence. Whether or not this theory be accepted, it is quite certain that adolescence is a period when a frequent outcrop of ancestral ways may be observed, and an influx of hereditary characteristics—good or bad—is to be expected.

The whole period is normally one of growth; but, just as much as its physiological manifestations may be checked by faulty nutrition, dissipation, immoral habits, or premature

work, so also may a corresponding arrest be suffered by the moral and intellectual faculties; an arrest which, in the opinion of sound authorities, may be held responsible for some at least of the many men and women laggards by whose existence society is hampered. It seems that no uncommon result of unfavourable environment during adolescence is a persistence of the lower appetites and instincts, associated with a defective development of the higher altruistic and inhibitory powers. Proclivities to certain forms of theft and assault in manhood may thus be due to such a persistence of the predatory and preying instincts of primitive man; vagrancy and pauperism may be attributed to the abnormal survival of the roving proclivities and unproductive food appetites of animals and savages.

Perhaps indeed, this is the most charitable way of drawing attention to the serious fact that the multiplication of those whose faculties from some one or other cause suffer permanent arrest, that is, the feeble-minded and defective, is at present proceeding apace, and that the ranks of our criminals and prostitutes are chiefly recruited from the offspring of feeble-minded parents. These and other corresponding tendencies to degeneration must therefore be curbed, directed and disciplined, directly they appear; for then it is often possible to utilize them along legitimate lines of activity, or to neutralize them by tactful methods of substitution or of counter attraction, as well as to stimulate the development of the inhibitory functions by which they can be repressed, or at least controlled.

The value of hobbies as an outlet for often misdirected energy can scarcely be over-estimated; for, at this age, the creative capacity is ripe for development and the impulse to hero-worship and to religious emotion is usually strong; the energies are also often super-abundant, and become perverted into undesirable channels, unless offered legitimate and wholesome outlets.

It must be already evident that the intelligent study of adolescence could be profitably approached from the standpoint of

physiology, of ethnology, and of pyschology. That some of the physiological and psychological phenomena characteristic of this period of life early attracted attention is to be deduced from the fact that they have been apparently associated with special ceremonial observances from pre-historic times. Numerous symbolic ceremonies are still performed with much elaboration among savage races to-day; they were practised in some one or other form by the Greeks, the Romans, and the Anglo-Saxons, and they still persist in the Christian Church, under the religious symbolism of the rite of Confirmation.

Puberty has been defined as the epoch between childhood and maturity, which is normally marked by the evolution of those organs directly concerned with the perpetuation of life and by other protean physiological changes. Its advent is characterized by certain internal developments which precede the external phenomena, and of which the only outward evidence is often a certain unrest and predisposition to nerve storms, hard to describe, but quite familiar to observant parents and teachers.

Among these physiological changes, may be mentioned an augmentation of blood pressure (except in the lungs), associated with rapid increase in the size of the heart; the temperature becomes slightly higher and the relative number of red blood corpuscles greater; there is also marked development of the muscular system and it is believed that a considerable increase of association fibres occurs in the brain; the whole series of developments being directed to the equipment of the adolescent for the demands made on endurance, on strength, and on reason by the sustained and individualized work of the adult.

That the direct connection between pubescence and the capacity for physical endurance was recognized by the Greeks is to be assumed from their scheme of physical training for boys, in which exercises necessitating a display of this quality do not find a place till adolescence. The observations made some two or three years since by Dr. Thomas, Assistant

Medical Officer to the London County Council Education Department, upon the physique of errand boys at various ages, clearly demonstrated the prejudicial effects of premature, prolonged or exhausting occupation *before* puberty and the less deleterious results after that period. These conclusions, based on physical examinations, are confirmed by the tests on School Fatigue exhaustively carried out in Japan by a Commissioner especially appointed for the purpose. The increased endurance associated with the post-pubertal period was at once apparent when comparisons were instituted between boys of the same age, but in different stages of physiological development. This question of "physiological" age is now receiving considerable attention, and, so far, the evidence collected suggests that in future the matter must be accorded far more consideration and prominence than it has been hitherto accorded.

The process of transition from girlhood to puberty is of greater complexity than in the corresponding case of boys, yet it is more direct and sudden in its accomplishment; and, whereas boys usually benefit at this age by abundant activity and constant occupation, girls need opportunities for adequate rest and must be safe-guarded from prolonged or constantly recurring over-exertion. In addition to other characteristic physiological developments, this period with them is associated with changes in the pelvic bones and in the angle of the vertical axis of the pelvis. The rapid growth of the hip bones, too, not only makes the girl of thirteen relatively taller than a boy, but affects the length and position of her body, and causes an awkward movement in walking. The better the development of the individual girl, the greater her difficulty in running and in ascending stairs. When the bust is prematurely full and heavy, care must be also exercised to avert spinal curvature (scoliosis), a not uncommon result, especially when muscular weakness or fatigue are also present.

Adolescence should be the healthiest portion of life, especially so after the advent of puberty; the preceding growth

accelerations are then usually over and the capacity for endurance comes into being; indeed, Dr. Ward Crampton has recently pointed out that, in future, the basis of practical legislation on Child-Labour will probably be found in the physiological age, not in the hitherto accepted age in year classification; *i.e.*, in the fact of pubescence or non-pubescence. This view is supported by other enquirers into the ability for sustained work or the relative fatigue of various studies upon boys of the same age, but of different degrees of maturity.

Unfortunately, in these days of indifferent nutrition, over-excitement and premature work, disorders of the digestion and anæmia are common enough; slight cardiac failure too may be manifested by shortness of breath, or palpitation; and stammering, or other forms of nervous debility have to be reckoned with. Though these ailments are, as a rule, readily responsive to appropriate treatment, neglect to secure this may mean lifelong inefficiency and suffering.

More trouble must be taken in the future to train adolescents in practical, personal hygiene, of which the great importance must not only be preached, but its practice must be required. Suitable, regular, well-masticated food: abundant sleep under good, but not self-indulgent, conditions: scrupulous cleanliness: adequate clothing: sufficient exercise: joy and pride in work—all these should constitute the hygienic creed of youth, during its apprenticeship to life.

But conformity to precept cannot be counted upon unless more straightforward teaching be given to each boy and girl upon the great responsibilities associated with the newly-acquired power to transmit life. Their duty to society and to the race must be kept steadily before them, and could in many cases be used as an argument against self-indulgence, self-neglect, vicious habits or pure heedlessness of consequences. Were the advice given by Prof. J. A. Thomson more generally adopted, there is no doubt that much mental distress would be saved, and much physical vice would be prevented. He urges that

the phenomena of sex, in their biological setting, as part of a world-wide process, should consistently be set before our young people, and suggests the emphasis of their evolutionary aspects, in the hope that the possibility of "ascent from crude expressions of physical fondness to rare heights of spiritual affection," may dawn early on the moral horizon, so that passion may be associated from the first with the higher emotions of chivalry, honour, and social self-respect.

Upon those who work, therefore, to this end, devolves the duty, possible though delicate, of acquainting their charges, appropriately, gradually, and truthfully, with the physical details of the mystery of human parenthood, and of the causes by the effects of which it is prejudiced or ennobled. Legitimate curiosity must be honestly, yet tactfully gratified as it arises, and no effort should be spared to establish a bond of sympathy with every young person, of sufficient strength to sustain the patience of the senior party and to command the full confidence of the junior; a bond which must remain unbroken while the maturing life ripens into greater stability and the capacity for self-direction and self-control is established.

No definite directions can be given for the fulfilment of this duty; its methods must depend upon the experience and knowledge of the teacher, and the temperament, age, and environment of the taught. But the caution must be given not to evade the responsibility on the plea of an ignorance which can be removed. More consistent and appropriate efforts and arrangements than hitherto must be also made to preserve and to encourage the right relations between the sexes at this critical age period. The craving for social pleasures, the love for active recreative pursuits, the spirit of co-operation, and the aspiration to play a part in a larger world than the home-circle are perfectly normal adolescent needs and interests. Their legitimate satisfaction must be permitted by those in authority, and suitable conditions for their common and mutual enjoyment by girls and lads must be provided.

The matter presses, not only from the standpoint of the moralist or the penologist, but of parentage and happy, well-ordered homes. These, in their turn, depend very largely upon a right choice being made at an age when the emotions quickly submerge all other considerations. Natural, healthful intercourse between young men and women, and the cultivation of mutual respect and of common interests through social comradeship, offer one strong lever by which the instinct of race-perpetuation can be raised from the plane of purely animal gratification to that of responsible realization of all that the pro-creation of children implies to the individual and to the community.

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BY

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