TEACHER'S HAND-BOOK

OF

PSYCHOLOGY

ON THE BASIS OF THE

"OUTLINES OF PSYCHOLOGY"

BY

JAMES SULLY, M. A., LL. D.

THIRD EDITION, REVISED AND ENLARGED

NEW YORK
D. APPLETON AND COMPANY
1, 3, AND 5 BOND STREET
1892

PREFACE TO THE FIRST EDITION.

The present volume is based on the writer's larger work, "The Outlines of Psychology." By considerably reducing and simplifying the statement of scientific principles there presented, and expanding the practical applications to the art of Education, he hopes he may have succeeded in satisfying an increasingly felt want among teachers, viz., of an exposition of the elements of Mental Science in their bearing on the work of training and developing the minds of the young.

HAMPSTEAD, *March, 1886.*

AMERICAN NOTE.

It is proper to say that the author of this book is paid a copyright by contract on all its sales; and that the larger work, the "Outlines of Psychology," was published under the same conditions. Mr. Sully also contributed a volume, several years ago, on "Illusions," to the International Scientific Series, an enterprise originating in our establishment for the advantage of foreign authors, who are paid at the same rates that are customary with American authors.

D. APPLETON & CO.

NEW YORK, *April* 21, 1886.

PREFACE TO THE THIRD EDITION.

In the present edition the writer has added an Appendix on "Method in Teaching," and a number of Notes. He trusts that the common and reasonable objection to a multitude of Notes may in this case be counteracted to some extent by their special character; for they are added in the hope that (unlike some Notes) they may enliven and not deaden the text.

HAMPSTEAD, *December, 1889.*

CONTENTS.

CHAPTER I.

PSYCHOLOGY AND EDUCATION.

CHAPTER II.

SCOPE AND METHOD OF PSYCHOLOGY.

CHAPTER III.

MIND AND BODY.

Chapter IV.

KNOWING, FEELING, AND WILLING.

Chapter V.

MENTAL DEVELOPMENT.

Chapter VI.

ATTENTION.

Chapter VII.

THE SENSES: SENSE-DISCRIMINATION.

Chapter VIII.

THE SENSES: OBSERVATION OF THINGS.

Chapter IX.

MENTAL REPRODUCTION.—MEMORY.

CHAPTER X.

MEMORY (CONTINUED).

CHAPTER XI.

CONSTRUCTIVE IMAGINATION.

CHAPTER XII.

ABSTRACTION AND CONCEPTION.

CHAPTER XIII.

ABSTRACTION AND CONCEPTION (CONTINUED).

Chapter XIV.

JUDGING AND REASONING.

Chapter XV.

JUDGING AND REASONING (continued).

Chapter XVI.

THE FEELINGS: NATURE OF FEELING.

CHAPTER XIX.

THE WILL: VOLUNTARY MOVEMENT.

CHAPTER XX.

MORAL ACTION: CHARACTER.

APPENDICES.

TEACHER'S HANDBOOK

OF

PSYCHOLOGY.

CHAPTER I.

PSYCHOLOGY AND EDUCATION.

Art and Science.—The doing of anything presupposes some knowledge, for every action is the employment of certain agencies which stand in the relation of *means* to our particular *end* or object of desire; and we could not select and make use of these means unless we knew beforehand that they were fitted to bring about the fulfillment of our desire. This is evident even in the case of simple actions. Thus, if after sitting reading for some time and becoming cold I go out and take a brisk walk, it is because I know that by so doing I am certain to recover warmth. And it is still more manifest in the case of complex actions. The action of an engineer, of a surgeon, or of a statesman, involves a quantity of knowledge of various kinds.

The knowledge which is thus serviceable for doing things or for practice is of two sorts. Thus, the knowledge implied in the above example, that muscular exercise promotes bodily warmth, may be knowledge that I have gathered from my own experience aided by what others have told me; or it may have been obtained from a study of the bodily organism and its functions, and of the effects of muscular activity on the circulation, etc. The first kind of knowledge, being derived from what may be called un-revised experience and observation, is called *empirical;* the second kind, being the outcome of those processes of revision and extension of every-day empirical knowledge which make up the work of science, is named *scientific.*

The chief differences between empirical and scientific knowledge are the following: (1) The former is based on a narrow range of observation, and on observation which is apt to be loose and inexact; the latter, on a wide survey of facts and on accurate processes of observation and experiment. (2) The former consists of propositions which have only a limited scope, and are never, strictly speaking, universally true; the latter is made up of propositions of wide comprehensiveness, and of universal validity, known as principles or laws. (3) As a result of this the conclusions deduced from empirical knowledge are precarious, whereas the conclusions properly drawn from scientific principles are perfectly trustworthy.

We call any department of practice an art when the actions involved are of sufficient complexity and difficulty to demand special study, and to offer scope for individual skill. Thus, we talk now of an art of cooking, because with our advanced civilization the preparation of food has become so elaborate a process as to call for special preparation or training.

Every art requires a certain amount and variety of knowledge. In the early stages of development the various arts were carried on by help of empirical knowledge. Thus, in agriculture men sowed certain crops rather than others in given soils, because they and their predecessors had found out from experience that these were the best fitted. Similarly in medicine, men resorted at first to particular remedies in particular diseases, because their practical experience had taught them the utility of so doing.

Such guidance from empirical sources was found to be insufficient. Workers in the various departments of art asked for a deeper knowledge of the agencies they employed and the processes they carried out, and so they had recourse to science. Thus the art of agriculture has profited from the sciences of chemistry and botany, and the art of medicine from the sciences of anatomy and physiology. Indeed, the demand for a fuller and more exact knowledge on the part of practical workers has been an important stimulus to the development of the sciences.

The reason of this is plain from what has been said above. The characteristic imperfections of empirical knowledge become more and more manifest as an art develops. And these defects are the more conspicuous in the case of the more complex arts, and particularly those which have to do with living things. This is clearly illustrated in the case of medicine. The organic processes going on in the human body are so numerous and complicated, there are so many variable circumstances which help to modify a disease in different cases, and so to interfere with a simple uniform effect of any given remedial agency, that the generalizations based on practical experience are continually proving themselves to be inadequate and precarious. The great modern improvements in the art of healing have been the direct outcome of the growth of the sciences underlying the art.

Hence we have come to employ in the case of all the more complex and intricate departments of practice the expression "science and art." Thus we talk of the science and art of engineering, of agriculture, and even of politics. To this pair of correlated terms there corresponds the equally familiar couple, "theory and practice." For the term theory in this connection refers more particularly to the principles or truths of a scientific rank which stand at the foundation of the art.

It is important to understand the precise place and function of these scientific principles in their relation to practice. First of all, then, they do not take the place of empirical generalizations. These are at first, as already remarked, the only knowledge by which an art can guide itself; and they always continue to form a valuable part of every theory of a practical subject. Science alone would never have taught men the best way to till the ground, to obtain metal from the soil, or to carry out any other set of industrial operations. The function of scientific principles is to supplement, interpret, and, where necessary, correct empirical knowledge. In this way the teaching of practical experience is rendered more precise and certain.

But science renders to art a yet greater service than this. It greatly enlarges the range of practical discovery. When once we have our scientific principles we can deduce practical conclusions from these, and thus anticipate the slow and uncertain progress of empirical discovery. Thus, in the art of surgery, the modern method of treating wounds is largely the direct outcome of scientific reflection on the nature of wounds and of the natural process of healing. Such deductions must, of course, be verified by actual experiment before they can take their place among the assured body of knowledge making up the theory of the subject. So that here, too, the theory of a practical operation is constituted by two factors—an empirical and a scientific. The only difference between this case and the first is that here the work of science precedes instead of following the work of experience, and, in place of having to supplement and interpret this, has to be supplemented and verified by it.

Art and Science of Education.—The above remarks may help us to understand the fact that the art of education is now seeking to ground itself on scientific truths or principles.

As an art, education aims at the realization of a particular end. This end must, of course, be assumed to be clearly defined before we can repair to science to ascertain what agencies we can best employ in order to compass it.

At first sight, however, it might seem that this condition is not satisfied. Writers have discussed at length what the true end of education is, and they have proposed very different definitions of the matter.

The reason of this uncertainty is apparent. Education, unlike such an art as cookery, has a large and comprehensive object, viz., to help to mold and fashion in certain definite ways no less complex a thing than a human being, with his various physical, intellectual, and moral capabilities, so as to fit him to fulfill his highest function and destiny. And to ascertain what the rightly fashioned man is like, and wherein consists his true work and service, is a problem of much difficulty. In truth, we can only satisfactorily settle this when we have determined the supreme ends of human action—in other words, the highest good of man. It is the province of the great practical science of ethics to ascertain this for us; and the teachers of this science have from ancient times been divided into opposed schools.

We need not, however, wait for the resolution of these grave and difficult problems. Men are to a large extent practically agreed as to what is right and wrong, though they have not settled the theoretic basis of these distinctions. In like manner educators are practically at one as to the objects they aim at. In spite of ethical and theological differences, we agree to say that education seeks, by social stimulus, guidance, and control, to develop the natural powers of the child, so as to render him able and disposed to lead a healthy, happy, and morally worthy life.

This is offered only as a rough approximation to a definition which may be generally accepted. In filling out this idea, different thinkers would no doubt diverge considerably, according to their conception of man's nature and destiny. Thus, to the firm believer in the Christian doctrine of a future life it must appear of the first consequence to develop those religious faculties and emotions the exercise of which constitutes man's highest function and the direct preparation for the larger and enduring after-life. But, while fully recognizing the truth that religious belief must throughout profoundly color a man's conception of the scope of education and the relative value of its several parts, one may assume that in practice educators of widely unlike theological views agree as to the main lines of education in its distinctly human aspects.

A word or two as to the scope of our definition. In the first place, we take education as aiming at the formation of faculty, rather than at the giving of information or the communication of knowledge. In other words, education, as the etymology of the word tells us (Lat., *educere*), has to do with drawing out, i. e., developing the mind and its various activities, and not merely with putting something into the mind. This distinction is often spoken of as that between education and instruction. But the word instruction (Lat., *instruere*) implies the orderly putting together of the materials of knowledge so as to form a structure. And, taken in this sense, there is no fundamental opposition between the two. The faculties of the intelligence can only be called forth and strengthened in the processes of gaining knowledge, and thus "education attains its end through instruction." The teacher may, however, fix his mind more on the educative result of his processes, viz., the ability to observe and reason about facts in the future, or on the immediate gain of school exercises in the shape of useful knowledge. And this difference in the teacher's point of view will deeply affect his ideas as to proper subjects to be taught, and even as to the best method of teaching them.

Finally, it is to be noted that our definition does not stop short at the intellectual side of the mind, but includes the other sides as well. The supposition that education is only concerned with the intellectual faculties probably has its source in the common error that the educator and the schoolmaster are synonymous terms, whereas in reality the latter is only one among many educators. And even the schoolmaster will err if he thinks his business ends with a mere intellectual discipline of his pupils.

But, while our definition is thus a wide one, it is less wide than that of some thinkers, e. g., J. S. Mill, who included under education the influence of external circumstances generally. Education is to us essentially the action of other human beings on the child, and this only so far as it is conscious and designed. Moreover, in its higher forms, education implies a systematic application of external forces and agencies according to a definite plan and an orderly method.*

* On the relation of instruction to education, see Prof. Payne's "Lectures on the Science and Art of Education," Lecture I, p. 18, etc.;

As soon as we approximate to a definition of education, as in the above, we see that merely empirical knowledge will carry us but a little way in realizing our object. For the human nature which it is our special business to develop is plainly the most complex of all living things. It is at once something material and something mental; and this mental part, again, is exceedingly composite in its constitution, being made up of a number of intellectual and moral capabilities and dispositions. Nor is this all; we find that these several physical and mental powers are joined together and interact upon one another in a very intricate and puzzling manner. Closely connected with this peculiar complexity of the child's nature, we have its great variability, showing itself in the unique constitution or idiosyncrasy of each individual child. Owing to these circumstances, mere experience could never have led men far on the right educational path. And as a matter of history we know that the older methods of educating the young were faulty, and in some respects radically wrong, just because they were not arrived at by aid of a profound and scientific study of child-nature. Thus, to take an obvious instance, the cardinal error of making so much of intellectual instruction dry and unpalatable arose out of ignorance of the elementary truth of human nature, that the intellectual faculties are only fully aroused to activity under the stimulus of feeling in the shape of interest. That this was the real source of the blunder is proved by the fact that the modern educational reformers, who have set themselves to correct this and other defects of the older system, were guided to these reforms by a deeper study of children's minds. This remark applies alike to the ideas of practical workers, as Pestalozzi, and of pure theorists, as Locke.*

and Mrs. Bryant's "Educational Ends," p. 5. On some alternative definitions of education, see Dr. Bain's "Education as a Science," chap. i.

* On the effects of an ignorance of psychology in rendering con-

What is really wanted as the groundwork of education is a body of well-ascertained truths respecting the fundamental properties of the human being, from which the right and sound methods of training the young may be seen to follow as conclusions. This theoretic basis will consist of facts and laws relating to the child's physical and mental organization, its various susceptibilities, its ways of reacting on external agents and influences, and the manner in which it develops. And these universal truths must be supplied by some science or sciences.

Divisions of Educational Science.—These principles are derived in the main from two sciences: physiology, or the science which treats of the bodily organism, its several structures and functions, and psychology, or mental science which deals with the mind, its several faculties and their mode of operation. The former principles, including certain applications of physiological science known as hygiene, underlie what is now called physical education, the training of the bodily powers and the furtherance of health. The latter form the basis of mental —i. e., intellectual and moral—training.

Within the limits of mental education we have certain subdivisions. Popularly we distinguish between intellectual and moral education; but this twofold division is inadequate. As we shall see by and by, the mind presents three well-marked and fundamental departments—viz., the intellect, the emotions, and the will. The development of it on any one of these three sides is to a certain extent a separate work, calling for its own particular mode of exercise, and, one may add, its own peculiar fitness in the teacher. These three directions of training are distinguishable as intellectual, æsthetic, and moral education. They correspond to the three great ends: (1) the logical end of truth, (2) the æsthetic end of beauty, and (3) the

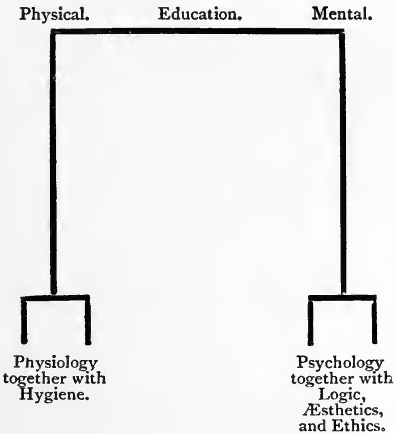
temporary educational practices faulty and even vicious, see Herbert Spencer, "Education," chap. i, p. 24, and following.

ethical end of virtue. The first aims at building up the fabric of knowledge, and developing the faculties by which knowledge is reached; the second, at such a cultivation of the feelings as will best subserve the end of a pleasurable existence, and in particular the appreciation and enjoyment of beauty in nature and art; and the third, at developing the will and forming the character.

In giving this assistance to education, psychology is supplemented by three sciences which are not purely theoretical like it, but have a more practical character, since they have as their special province to regulate the activity of the mind on each of these three sides. These are logic, which regulates our intellectual operations by supplying us with rules for correct reasoning; æsthetics, which aims at giving us a standard of beauty and criteria by which we may judge of its existence in any instance; and ethics, which fixes the ultimate standard of right and wrong, and determines what are the several duties and virtues.

The scientific groundwork of the art of education may be made clear by the following diagram:

FIG. 1.



Psychology and Education.—Of the sciences that contribute principles to education, psychology is plainly the most important. The teacher is most directly concerned with the development of the child's mind, and considers his bodily organism mainly in its connection with mental efficiency.

Again, since the teacher is commonly supposed to have as his principal object the exercise of certain of the intellectual faculties—viz., those employed in the acquisition and retention of knowledge—it is clear that some portions of psychology will be of special value to him. Thus the laws governing the processes of acquiring and reproducing knowledge will have a peculiarly direct bearing on the teacher's work. Such truths of mental science would seem to be specially fitted to supply principles of education.

At the same time, it is clearly impracticable to select certain portions of psychology as exclusively applying to education. For, first of all, even allowing that education need busy itself only with instruction, or the communication of so much useful knowledge, it may be said that the teacher still needs to study other faculties than the acquisitive; for psychology teaches us that no power of the mind works in perfect isolation. Thus, it has come to be recognized that, in order that a child should gain clear knowledge through words, his observing faculties must have undergone a certain discipline, so that his mind may have been stored with distinct and easily reproducible images of objects in his actual surroundings. Hence, one reason for including the training of the senses in modern systems of education. More than this, it will be found that there can be no adequate exercise of the intellect which does not take account of the feelings, in the shape of interest and a love of learning.

It follows, then, that the teacher needs some general acquaintance with the principles of psychology, even though he is aiming merely at the most rapid and effective method of storing the mind with knowledge. But it may be assumed that few teachers now limit their efforts to this object. Education, in its true sense, is commonly aimed at by intelligent teachers in the process of instruction itself, which thus becomes, in a measure at least, a means to an end beyond itself. And some attention is paid, as time allows and opportunity suggests, to the cultivation of the feelings and the formation of good moral dispositions and habits. And this being so, a clear apprehension of the different sides of mind, and of the way in which they interact one on another, may be said to be of immediate utility to the teacher. In other words, the principles of education must be derived from the elementary truths of psychology taken as a whole.

It follows, from what was said above concerning the relation of science to art, that there are two principal uses of mental science to the teacher: (1) An accurate acquaintance with the mental faculties, which are the material that the educator has to operate on and mold into shape, will supply him with a criterion or touchstone by which he may test the soundness of existing rules and practices in education. (2) The knowledge so gained may be made to directly suggest better educational rules than those in vogue, and so to promote the further development of the art.

No doubt we may expect too much from a study of mental science. We may err by supposing that scientific knowledge will render practical or empirical knowledge superfluous, instead of merely supplementing and correcting it. And it may be well to remember, therefore, that, as a science, psychology can only tell us what are the *general* characters of mind, and point out the best way of dealing with it in its general features and broad outlines; it can not acquaint us with the manifold diversities of intelligence and disposition, or suggest the right modifications of our educational processes to suit these variations.

Accordingly, the educator will always need to supplement his general study of mind by a careful observation of the individual minds which he is called upon to deal with, so as to properly vary and adapt his methods of teaching and disciplining.

Even here, however, the student of psychology will find his scientific knowledge useful. For the work of getting to know an individual child is one not only of observation but of interpretation. And in the performance of this a general acquaintance with mind will materially assist. It is evident, indeed, that we never understand an individual thing thoroughly except in the light of general knowledge. A botanist only comprehends a new plant when he classifies it—i. e., refers it to a general description or head, and accounts for it by help of general botanical principles. Similarly we only understand a particular child when we bring to bear on it a previous *general* knowledge of child and human nature. And while psychological knowledge thus aids us in reading the individual characters of children, it assists us further in determining the proper modifications of our educational methods to suit these variations. Experience is without doubt our main guide here. What kind of punishment, for example, will be most efficacious and salutary for boys of a particular temperament, etc., is a problem which must be solved to a large extent by the results of actual trial. Still, our scientific principles are a valuable supplementary aid here also, not only by helping us to understand the different results of our educational treatment in different cases, but also by assisting us in lighting upon the required modifications.

APPENDIX.

On the scope and aim of education and its special relation to psychology, the student may consult: Prof. Payne's "Lectures on the Science and Art of Education," Lectures I and II; Dr. Bain's "Education as a Science," chap. i; Th. Waitz's "Allgemeine Pädagogik," Einleitung, § 1.[a]

CHAPTER II.

SCOPE AND METHOD OF PSYCHOLOGY.

PSYCHOLOGY, or mental science, may be defined as our general knowledge of mind, and more particularly the human mind, reduced to an exact and systematic form. In order to understand this definition, we must try to give precision to the term *mind.*

Scientific Conception of Mind.—We commonly distinguish between a mind as a unity or substance and the several manifestations or phenomena of this substance. In every-day discourse, indeed, we talk of our own and others' minds as the subjects of various feelings, ideas, etc. Psychology as a science does not inquire into the nature of mind in itself, or as a substance, but confines itself to the study of its several states or operations. It is the different forms of activity of mind that we can observe in our actual mental experience or mental life that constitute the proper subject-matter of our science. And it is plain that this knowledge of the mind in actual operation, and of the various ways in which it manifests itself and works, is what we need for practical guidance, whether of our own or of others' minds.

How, now, shall we mark off these mental facts from other phenomena which form the subject-matter of the physical sciences? We can not define such states of mind by resolving them into something simpler. They have nothing in common beyond the fact of being *mental* states.

Hence, we can only use some equivalent phrase, as when we say that a mental phenomenon is a fact of our conscious experience or conscious life. Or, again, we may enumerate the chief varieties of these mental phenomena, and say that mind is the sum of our processes of knowing, our feelings of pleasure and pain, and our voluntary doings. Popularly, mind is apt to be identified with knowing or intelligence. A man of mind is a man of intellect. But though intelligence is perhaps the most important part of mind, it is not the whole. In mental science we must reckon the sensation of pain arising from a bruise as a fact of mind. Or, finally, we may set mind in antithesis to what is not mind. Mind is non-material, has no existence in space as material bodies have. We can not touch a thought or a feeling, and one feeling does not lie outside of another in space. These phenomena occur in time only. Mind is thus the inner smaller world (mikrokosm) as distinguished from the external and larger world (makrokosm).

Mind and Body.—While it is important thus to set mind in strong opposition to material things, we must keep in view the close connection between the two. What we call a human being is made up of a bodily organism and a mind. Our personality or "self" is a mind connected with or embodied in a material framework. As we shall see presently, all mental processes or operations are connected with actions of the nervous system. The most abstract thought is accompanied by some mode of activity in the brain-centers. Hence, while we must be careful not to confuse the mental and the material, the psychical and the physical, as though they were of the same kind (homogeneous), we can not exclude the latter from view in dealing with mind. We must always think of mind as attended by, and, in some inexplicable way, related to, the living organism, and more particularly the nervous system and its actions. And this recognition of this close and constant companionship with body is a matter of great practical moment in seeking to train and develop the mind.

The Subjective Method.—There are two distinct ways of knowing mind. The first is the direct, internal, or subjective way.* By this method we direct attention to what is going on in our own mind at the time of its occurrence, or afterward. We have the power of turning the attention inward on the phenomena of mind. Thus we can attend to a particular feeling, say emulation or sympathy, in order to see what its nature is, of what elementary parts it consists, and how it is affected by the circumstances of the moment. This method of internal or subjective observation is known as introspection ("looking within").

The Objective Method.—In the second place, we may study mental phenomena not only in our own individual mind, but as they present themselves externally in other minds. This is the indirect, external, or objective way of studying mental phenomena. Thus we note the manifestations of others' feelings in looks, gestures, etc. We arrive at a knowledge of their thoughts by their speech, and observe their inclinations and motives by noting their actions.

This objective observation embraces not only the mental phenomena of the individuals who are personally known to us, old and young, but those of others of whom we hear or read in biography, etc. Also it includes the study of minds in masses or aggregates, as they present themselves in national sentiments and actions, and in the events of history. It includes too a comparative study of mind by observing its agreements and differences among

* "Subject" means the mind as knowing something, or as affected (pleasurably or painfully) by a thing. "Object" is that which is known, or which affects the mind in a certain way. The house I see, the flower I admire, are objects to me, who am the subject that sees and admires them.

different races, and even among different grades of animal life. The study of the simpler phases of mind in the child, in backward and uncivilized races, and in the lower animals, is especially valuable for understanding the growth of the mature or fully developed human mind.

Both Methods must be combined.—Scientific knowledge is characterized by certainty, exactness, and generality. We must observe carefully so as to make sure of our facts, and to note precisely what is present. And we must go on from a knowledge of the particular to a knowledge of the general. From this rough definition of what is meant by scientific knowledge we may easily see that neither the internal nor the external method is complete without the other. To begin with: since we only *directly* observe what is passing in our own individual mind, some amount of introspection is the first condition of all certain and accurate knowledge of mental states. To try to discover mental phenomena and their laws solely by watching the external signs and effects of others' thoughts, feelings, and volitions, would plainly be absurd. For these external manifestations are in themselves as empty of meaning as words in an unknown tongue, and only receive their meaning by a reference to what we ourselves have thought and felt. On the other hand, an exclusive attention to the contents of our individual mind would never give us a *general* knowledge of mind. In order to eliminate the effects of individuality, we must at every step compare our own modes of thinking and feeling with those of other minds; and the wider the area included in our comparison, the sounder are our generalizations likely to be.

Each of these ways of studying mind has its characteristic difficulties. To attend closely to the events of our mental life presupposes a certain power of "abstraction." It requires at first a considerable effort to withdraw the attention from the more striking events of the external world, the sights and sounds that surround us, and to keep it fixed on the comparatively obscure events of the inner world. Even in the case of the trained psychologist the work is always attended with a peculiar difficulty. On the other hand, there is a serious danger in reading the minds of others, due to an excess of the propensity to project our own modes of thinking and feeling into them. This danger increases with the remoteness of the mind we are observing from our own. To apprehend, for example, the sentiments and convictions of an ancient Roman, or of an uncivilized African, is a very delicate operation. It implies close attention to the differences as well as the similarities of external manifestation, also an effort of *imagination* by which, though starting from some remembered experiences of our own, we feel our way into a new set of circumstances, new experiences, and a new set of mental habits.

Observation of Children's Minds.—These difficulties are strikingly illustrated in the attempt to note and interpret the external manifestations of children's minds. This observation is of the greatest consequence to psychologists in general, for a sound knowledge of the early manifestations of mind is a necessary preliminary to a scientific explanation of its later developments. And to the educator this knowledge constitutes the most important department of the science of mind. Yet this is perhaps one of the most difficult branches of psychological inquiry.

The reason of this can easily be seen. Children have their own characteristic ways of feeling, of regarding things, of judging as to truth, and so forth. And, although the adult observer of children has himself been a child, he is unable, except in rare cases, to recall his own childish experiences with any distinctness. How many of us are really able to recollect the wonderings, the terrors, the grotesque fancies of our first years? And then children are apt to be misunderstood because they have to use our medium of speech and often fail to seize its exact meaning.

Nevertheless, these difficulties are not insuperable. They can be got over where there are present the qualifications of a good observer and an earnest purpose. And it must be borne in mind that if there are special difficulties in the case, there are also special facilities. For children, as compared with adults, are frank in the manifestation of their feelings, and free from the many little artifices by which their elders are wont, only half consciously perhaps, to disguise and transform their real thoughts and sentiments in expressing them to others.

The special qualities needed for a close observation and deep understanding of the child-mind are good observing habits and a strong, loving interest in childhood. Both of these are necessary. If we have only the first, we shall fail to see far into child-nature, just because we shall not take the trouble to place ourselves, in imagination, in the circumstances of children, so as to realize how they are affected by things. A warm, tender interest, leading to a habit of unfettered companionship, seems to be a condition of a fine imaginative insight into children's minds, and a firm grasp of the fact that their ways differ in so many particulars from our ways. On the other hand, if there is the kindly feeling without the trained faculty of observation, there is the risk of idealizing childhood, and investing it with admirable traits that do not really belong to it.

In the matter of child-observation the psychologist may look to the educators of the young, the parent and the teachers, for valuable aid. Some of the best observations on the subject of the infant mind which we already possess have been contributed by fathers. And much may still be done by parents in the way of recording the course of development of individual children. At the same time, school-teachers, though coming into less intimate relations with individual children, have the very great advantage of observing numbers. And from them we may reasonably ask for statistics of childhood. The dates at which certain faculties become prominent, the relative strength of the several feelings and impulses, the dominant intellectual and moral characteristics of children, these and other points are all matters about which teachers, who will take the trouble to note accurately, may be expected to supply the psychologists of the future with much valuable knowledge.*

General Knowledge of Mind.—As has been observed, science consists of general knowledge, or knowledge expressed in a general form. Hence, mental science seeks to generalize our knowledge of mind. In the first place, it aims at grouping all the phenomena observed under certain heads. That is to say, it classifies the endless variety of mental states according to their resemblances. In so doing it overlooks the individual differences of minds and fixes attention on their common features. A sound scientific classification of mental states is a matter of practical importance, whether we are dealing with minds in the earlier or the later stages of development. Thus, the teacher will be in a far better position to deal with a child's mind, both in its several parts and as a whole, when he has reduced the tangle of mental manifestations to order and simplicity.

In the second place, every science aims not only at ordering its phenomena, but at making certain assertions about them. There are general truths or laws which hold good of numerous varieties of phenomena. When the phenomena are occurrences in time, these laws have to do with the relation of events to other events preceding or

* On the qualifications of an observer of children's minds, and on the literature of the subject, see the writer's Introduction to M. Perez's work, "The First Three Years of Childhood." London: W. Swan Sonnenschein & Co.

succeeding them. That is to say, they formulate the relations of causal dependence of phenomena on other phenomena. Mental science seeks to arrive at such truths or laws of mind. Its ultimate object is to determine the conditions on which mental phenomena depend. Thus, the psychologist asks what are the conditions of retention, what are the circumstances which produce and favor the keeping of impressions in the mind. And it is this knowledge of conditions and of laws which is of greatest practical value. For it is only by understanding how a mental product is formed that we can help in forming it, or interfere so as to modify the process of formation.

Now, a little attention to the subject will show that mental phenomena are related in the way of dependence not only to other phenomena immediately preceding, but to remotely antecedent phenomena. For example, the quick response of a child to a command depends not only on certain present conditions, viz., attention to the words of the command, etc., but on past conditions, on the formation of a habit, which process may have been going on for years. Hence, the consideration of relations of dependence leads on to the view of mind as a process of growth or development. The most important laws of mind, from the educator's point of view, are laws of mental development.

Before we go on to consider the several groups of mental states in detail and the laws which govern them, we shall do well to look at mind from the physiological side, that is to say, at the way in which the mind as a whole is affected by its connection with the bodily organism. This aspect of our subject will occupy us in the next chapter.

APPENDIX.

For a fuller account of the scope and method of psychology the reader is referred to my larger work, "Outlines of Psychology," Appendix A; also to the works referred to in the appendix to Chapter II of that volume; and particularly to Dr. J. Ward's article "Psychology," in the 9th edition of the "Encyclopædia Britannica."

CHAPTER III.

MIND AND BODY.

Connection between Mind and Body.—When we say that mind and body are connected, we are simply stating a fact of our every-day experience, and a fact which scientific observation and experiment are rendering more and more certain and precise. That is to say, we affirm that mental processes or operations are in some way conjoined with bodily operations. We do not make any assertion as to the ultimate nature of mind or of body, or seek to account for the apparent mystery of two things so utterly disparate as mind and body being thus united in one living being. These problems lie outside science altogether, and belong to the domain of philosophy or metaphysics.

Keeping then to the *phenomena*, or observable processes of mind and of body, we find first of all that these are clearly conjoined in time. That is to say, mental activity goes on along with bodily activity and always has this for its accompaniment. We know nothing of mental operations that are unattended by physical changes in certain portions of the body. And some of these physiological processes appear to be perfectly simultaneous with the mental operations to which they correspond. In the second place, there is an apparent interaction between the mental and physical processes. As we shall see presently, there are certain organs of the body which are in a peculiar way subservient to the discharge of the several mental functions. According to their state at any time will mental activity be lively or otherwise. Moreover, by influencing these physical organs we may produce changes in the correlated mental operations. Hence we are justified in speaking about these organs as the physiological support of mind, and of their activity as the condition of mental activity. On the other hand, mental processes react on the bodily organism. Thus excessive intellectual activity, violent grief, and so forth, are known to have far-reaching effects on the bodily functions.

The Nervous System.—The particular organs which thus subserve our mental life are known as the nervous system, of which the brain is one of the most important parts. These are therefore known as the organs of mind.*

The nervous system is a connected set of physiological structures, composed of a very fine or highly organized form of living matter. These fall into two main divisions: compact masses known as nerve-centers, lying protected within the bony covering of the skull and backbone; and extensive thread-like ramifications known as nerves, connecting these central masses with outlying regions of the body.

The nerves, which are bundles of exceedingly fine white fibers or threadlets, are the carrying portion of the nervous apparatus. They are of two classes. The first connect the centers with outlying surfaces, which are susceptible of being acted on by certain external agents or stimuli, such as mechanical pressure, heat, etc. Their function is to transmit the state of nervous activity produced by this stimulation from the periphery to the center. Hence they are known as incarrying or afferent

* The nervous system here means the cerebro-spinal system as distinct from the sympathetic system which subserves the lower vital functions of the body.

nerves. Since the central effect of this transmission of the active state is what we call a sensation, these nerves are also called sensory nerves, and the peripheral surfaces sensory surfaces. Such are the skin, the retina of the eye, etc. The other class of nerves connect the centers with muscles, or those bundles of fiber by the contractions of which the limbs are moved and the voice exercised. They carry nervous impulses from within outward, and are known as outcarrying or efferent nerves. And since this outgoing activity immediately precedes and produces muscular contraction, and so movement, they are also called motor nerves.

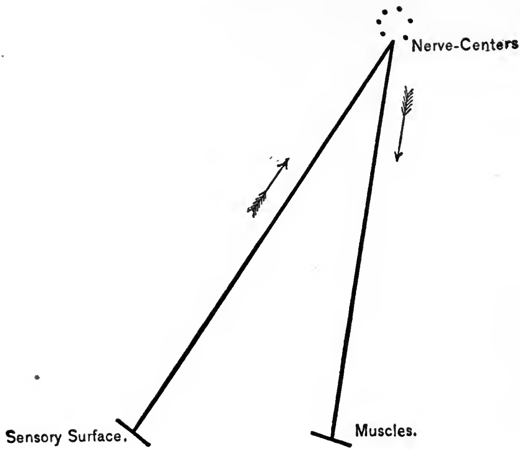
The nerve-centers are made up partly of gray masses having a minute cellular structure, and partly of bundles of nerve fiber, connecting these masses one with another, both laterally and longitudinally. They have as their peculiar function to transform sensory stimulation into movement, and to adjust the latter to the former; also to bring together the results of different sensory stimulations, and to adjust complex groups of movements to groups of impression.

These nerve-centers are arranged in a series or scale of growing complexity. The lower centers are those residing in the backbone and known as the spinal column. The higher centers lodged within the skull are called the brain.

From this brief description of the nervous system, it will be seen that the general form of nervous action is a process of sensory stimulation followed by one of motor excitation. This may be represented by the diagram, Fig. 2.

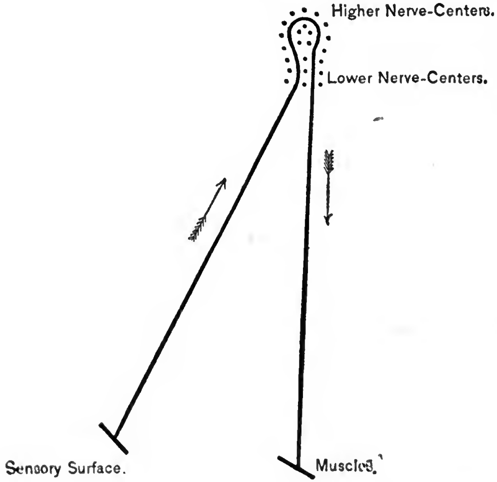
This scheme roughly answers to the simpler type of actions of ourselves as well as of the lower animals, the type known as reflex action, i. e., movement in immediate response to external stimulus. Thus, when a child asleep instantly withdraws his foot when this is pressed, the action is effected by means of the lower spinal centers. Such reflex actions, however, are not attended with any mental activity; they are unconscious.

FIG. 2.



The more complicated actions involve the co-operation of the brain as well. In this case we have to suppose that

FIG. 3.



the sensory stimulation, instead of passing over at once into motor impulse, is propagated further, and engages a larger portion of the central structures. This may be represented by the diagram, Fig 3.

Such complicated actions are accompanied by mental activity or consciousness. They may be illustrated by the act of relieving the pressure of a tight boot by stooping and taking it off. This action involves a distinct sensation of pressure, and the action of the will in resolving to get rid of the discomfort.

The Special Organs of Mind.—We see from this that mental life is connected with the action of the higher centers, or the brain. Only when the brain is called to take part is there any distinct mental accompaniment. The brain thus stands in relation to the lower centers somewhat as the head of an office stands in relation to his subordinates. The mechanical routine of the office is carried on by them. He is called on to interfere only when some unusual action has to be carried out, and reflection and decision are needed. Moreover, just as the principal of an office is able to hand over work to his subordinates when it ceases to be unusual and becomes methodized and reduced to rule, so we shall find that the brain or certain portions of it are able to withdraw from actions when they have grown thoroughly familiar. This is illustrated in the actions which we perform with little consciousness because they have become easy and mechanical by repetition and habit.

According to this view, the activity of the brain, together with the mental life which accompanies it, intervenes between the action of external things on the organism and the active response of this organism, and subserves the higher and more complicated adjustments of muscular movement to sensory stimulation. All the earlier and simpler forms of cerebral activity are excited by the action of external sensory stimuli, and are directed to the performance of external actions in the immediate future.

The later and more complicated actions of the brain do not conform to this description. We carry out many processes of reflection which have nothing to do with the external surroundings of the moment, and which, moreover, are not directed to the immediate realization of any desire or purpose. Much of the intellectual life of educated people is of this internal character. But even this apparently isolated internal activity of the brain may be reduced to the same fundamental type, by considering it as indirectly excited by impressions from without, and as a preparation for remote actions, certain or contingent, in the future. Thus, the study of a science like chemistry or astronomy may be described as only a high stage of elaboration of materials obtained from sense, and as undertaken because of its remote bearings on our actions.[1]

Nature of Nervous Action.—The precise nature of nervous action is still a matter of uncertainty. It appears to be some form of molecular movement of a vibratory character, and propagated somewhat in the manner of other vibratory movements, as those of heat and electricity.

The nerve-centers are a storehouse of energy, and their action increases the force of the current of stimulation which passes through them. This originating action of the central structures is known as the nervous discharge, and involves the liberation of energy which was previously stored up in a latent condition. This setting free of nervous energy is effected by a process of disintegration or disorganization in which the highly organized matter of the brain undergoes chemical changes and enters into combination with the oxygen which is brought by the blood. The force thus liberated may accordingly be said to have been supplied by the process of nutrition, and to have become latent in the work of building up the organic substance of the brain. The relation between brain-nutrition and brain-action has been illustrated by the following analogy. If we take a number of bricks and set them up on end in a row sufficiently near one another, a slight amount of pressure applied to the first member of the series will cause the whole to fall, each brick adding something to the force of the transmitted impact. Our muscular work in setting up the bricks was transformed into latent or potential energy, viz., that involved in the unstable position of the bricks and their liability to fall. According to this analogy, the organic substance of the brain is an unstable compound easily broken up, and so constituting a reservoir of force.

We see from this that the nerve-substance is being ever unmade and remade, or disintegrated and redintegrated; and, further, that there is a necessary correlation between these two processes of decomposition and reparation, so that no nervous action is possible except nutrition has first done its work.

Mental Activity and Brain Efficiency.—As already pointed out, mental activity is directly connected with the exercise of brain-function. When a child uses his mind in any way, either by trying to learn something or by giving way to great emotional excitement, his brain is at work. The greater the mental activity, the more the resources of the brain are taxed. This activity of the brain necessitates an increased circulation of the blood in the organ, both for supplying the nutritive materials required, and for furthering the process of nervous action itself by an adequate supply of oxygen, and by a sufficiently rapid removal of the waste products.

If the brain thus furnishes the physical support of mental activity, it is to be expected that this will vary in amount with the state of the organ. And this is what we find. We all know that if the nervous energy is lowered in any way, as by bodily fatigue, grief, etc., the brain refuses to work smoothly and easily. On the other hand, the action of stimulants, as alcohol, on the brain illustrates how the mental activity may for a time be raised by adding to the excitability, and so intensifying the activity of the brain.

The amount of disposable energy in the brain at any time, and the consequent readiness for work, will vary with a number of circumstances. (1) Since the brain and nervous system as a whole are parts of the bodily organism, that is to say, a system of organs closely connected with and powerfully interacting on one another, any considerable fluctuation in the condition of one of the other organs will tell on the efficiency of the brain. Thus the special demand on the digestive organs after a good meal, leading to a diversion of blood as well as of nervous energy in that direction, interferes for the time with brain-work. Similarly great muscular exertion militates against mental application. Again, a disturbance of the proper function of the vital organs, such as a fit of indigestion or an impeded circulation of the blood, is known to be an obstacle to mental activity. Once more, all fluctuations in the condition of the organism as a whole, whether the periodic exaltation and depression of the physical powers which constitute the daily vital rhythm of the body, or the irregular changes which we call fluctuations of health, involve the brain as well. The organ of mind shares with the whole body in the vigor and freshness of the morning, and the lassitude of the evening; and it shares in the fluctuating well-being of the body. Lastly, the mind, in conjunction with the body, passes through the longer processes of growth and decay which constitute the course of the individual life.

Brain-Activity and Brain-Fatigue.—(2) While the efficiency of the brain thus depends on the state of the bodily organs, it is affected by the preceding state of the organ itself. Thus, after a period of rest, the nervous substance being duly renewed, there is a special readiness for work. It is this circumstance which explains the invigorating effects on the powers of the brain of sound sleep, and of less complete forms of mental repose, such as are found in the lighter intellectual recreations. On the other hand, all brain-work tends to exhaust the nervous energy and so to lower the subsequent efficiency.

If the work is light in character, the effects are of course less noticeable: nothing like brain-fatigue is induced, and we may be unaware of any falling off in power. On the other hand, after a severe application of the mind, even for a short time, we become distinctly aware of certain sensations of fatigue, as well as of a temporary falling off in vigor. In the case of children, whose stock of brain-vigor is much smaller, these effects show themselves much sooner.

The physiological explanation of these facts is as follows: In the lighter kinds of brain-activity, the consumption of brain-material being small, the process of recuperation easily keeps pace with it. On the other hand, in the heavier sorts of mental work, energy is consumed faster than it can be supplied; the process of redintegration does not keep pace with that of disintegration. This points to the necessity of a frequent relaxation of the nervous strain, especially at the beginning of school-life.

Effects of Brain-Activity on the Organism.—But this is not the whole effect of brain-activity. In cases where the powers of the organ are taxed for a prolonged period, other organs are liable to be affected. Thus, since prolonged brain-exercise draws off the blood in too large a quantity to that organ, it is apt to impede the general circulation, and so to give rise to the familiar discomforts of cold feet, etc. Graver results may ensue in the case of the too eager student who by using up nerve-energy too extravagantly in brain-work leaves too little for the other functions of the nervous system, and more particularly the regulation of the vital processes, and so becomes the subject of chronic dyspepsia, etc. We thus see that while the state of the bodily organs influences that of the brain, there is an important reciprocal action of the higher organ on the lower ones.

Overtaxing the Brain.—It follows from the above remarks that it is possible to exact from the brain more work than it is good for it to perform. Wherever brain-work is accompanied by a distinct feeling of fatigue, this points to an overstimulation of the organ. By overstimulation is meant, first of all, bringing pressure to bear on the brain so as to excite it to activity beyond the point at which recuperation keeps pace with expenditure of energy; and, secondly, the exercise of the brain disproportionately, that is, in relation to the other organs of the body, more particularly the vital organs.

It is exceedingly important to distinguish this second and more profound sense of the term overstimulation from the first. There can be overexercise of the brain when the local symptoms of brain-fatigue are not present. The brain, like the other organs, learns to adapt itself within certain limits to the amount of work required of it. A child, when first subjected to the prolonged and systematic stimulation of the school, comes in a short time to feel less of the strain of mental application. This may mean a diminution of effort by the normal results of exercise and growth; but it may also mean that the increased activity of the organ is due to an unfair distribution of the physical energy, the organ of mind being enriched at the expense of the vital organs.

Now, this risk is peculiarly great in early life, when a large fund of nutritive material is needed for the processes of growth. Severe exercise of any organ, by using up material in functional action, though it may further the *development*, i. e., the higher structural condition of that organ, is directly opposed to the *growth*, that is, the expansion in bulk of the body.

All severe exercise of the brain in early life is opposed to the laws of development of the child's being. According to these the lower vital functions are developed before the higher. First comes the vegetal or nutritive life; then the common animal life of sense and movement; and finally the distinctly human life of mind. The development of these higher mental functions is only normal and safe when a firm basis of physical strength and well-being has first been laid down. To try to force on the functions of the brain in advance of those of the vital organs is to endanger the whole organism, and along with this the organs of mind themselves.*

In thus touching on the risks of educational pressure, it may be well to add that they are susceptible of being overrated as well as underrated. It is an error to suppose that all systematic teaching tends in the direction of over-excitation of the brain. So far from this being the case, it may be confidently said that within certain limits mental occupation is distinctly beneficial to the child. Every organ requires a certain amount of exercise in order to continue in a healthy and vigorous condition. Children deprived of the material for mental activity suffer from tedium, which may be viewed as a symptom that the mind and brain are in need of exercise. Many children have become happier and healthier after entering on school-life, and this not merely because the school supplied healthier physical surroundings, but also because it supplied a healthier *régime* for the brain. To this is to be added that, as already pointed out, the brain, like other organs, grows stronger by exercise, and within certain limits it is perfectly safe to carry on a progressively increasing stimulation of the organ.

Remission and Variation of Brain-Exercise.— The great danger, especially with young children, is that of unduly prolonging the duration of the mental strain at one time. A short exertion even of great severity is innocuous, whereas an unbroken application of mind to a difficult subject for half an hour or more may be injurious. One of the greatest improvements in modern educational

* On the injurious effects of excessive stimulation of the brain in retarding bodily growth, see Herbert Spencer, "Education," chap. iv, p. 165, and following.

methods, considered both from a hygienic point of view and from that of mental efficiency itself, is the substitution of short for long lessons, and the frequent alternation of mental and bodily exercise. These breaks, though, in appearance, occasioning a loss of time and adding to the teacher's labors in restoring order and recalling the pupil's minds to the calm attitude of attention, are in reality a true economy of time and force.

Since the brain is a complicated group of structures, it is reasonable to suppose that different regions are specially engaged in different kinds of mental activity. And modern science, while rejecting the definite mapping out of the brain functions proposed by the phrenologists, is distinctly tending toward a new and carefully verified theory of localization of function. Adopting this view of brain-action as engaging special centers at different times, we may see that the due variation of school subject owes a part of its value at least to the circumstance that it fulfills in a subordinate manner the purpose of brain-rest. Thus, by passing from an object lesson to a singing lesson, the centers of vision are put into a condition of comparative rest, while other centers, the auditory and vocal, which have been recuperating, are called into play. And as science enables us to localize the brain functions more exactly, the theory of education will probably receive from it further guidance as to the best way of varying school exercises.

Differences of Brain-Power.—The educator should bear in mind that children are endowed with very unequal cerebral capacity. The whole sum of vital force is a different one in the case of different children, and the distribution of this among the several organs is also different. Hence, an amount of mental exercise that would be quite safe in one case would be harmful in another. The individual co-efficient of brain-power is the limit set by nature to the teacher's efforts, and he can not afford to ignore it.

This co-efficient determines the amount of mental reaction to external stimulus. Just as one and the same physical stimulus will evoke very unequal amounts of muscular activity in the case of a vigorous and a feeble body, so the same quantity of intellectual stimulus will call forth very unlike mental reactions in the case of a robust and a weakly brain. This varying co-efficient of brain-power is seen very distinctly in the different rates of mental work of different children. It is not too much to say that the whole range of mental acquisition is in each case fixed from the first by the child's cerebral capacity.

APPENDIX.

The connection of body and mind is handled by Dr. Bastian, "The Brain as an Organ of Mind"; Dr. Maudsley, "The Physiology of Mind"; and Dr. Bain, "Mind and Body." The educational bearings of the subject are brought out in Dr. A. Combe's "Principles of Physiology"; in Mr. Spencer's "Education," chap. iv; Dr. Bain's "Education as a Science," chap. ii; and in a number of recent publications on Physical Education. See especially the essay on "Education and the Nervous System," by Sir J. Crichton Browne, in "The Book of Health."

CHAPTER IV.

KNOWING, FEELING, AND WILLING.

Mental Phenomena and Operations.—As was pointed out above, mental science consists of an orderly arrangement of the general truths, or laws which relate to mental phenomena. In order to arrive at these truths, we have first to ascertain what our phenomena are, and to arrange them in general groups or classes, based on fundamental points of likeness.

Mental phenomena are known by different names. They are commonly called states of mind, or states of consciousness. Since, however, they are phenomena in time, having a certain duration and a succession of parts, they are just as often spoken of as mental processes or operations. It is important, further, to distinguish between a mental process or operation and its result or product. Thus we distinguish between a process of perception, and its result, a percept; a process of association and suggestion, and its product, a recollection; between an operation called reasoning and its result, rational conviction, and so forth.

Classification of Mental Operations.—If we compare our mental states at different times, we find them presenting very different characters. Sometimes we describe ourselves as experiencing *feelings* of joy, grief, etc., at other times as *thinking* about a matter, and so forth. And, if we look more closely at the contents of our mind at one and the same time, we are commonly able to distinguish between different ingredients, as emotions, recollections, desires.

Common thought has long since distinguished between different classes or varieties of mental operation. Scientific research carries this process further, and seeks to reach the most fundamental differences among our mental operations. This is commonly described as *dividing* mind into its fundamental functions, and also as *analyzing* it into its elements.

If we examine the every-day distinctions of popular psychology, we find that there are three fairly clear divisions which do not seem to have anything in common beyond being all modes of mental activity. Thus we ordinarily describe such activities as perceiving, remembering, and reasoning, as *intellectual* operations. So, again, we bring sorrow, joy, love, anger, and so on, under the general description of *feeling* or *emotion*. And, finally, we gather up operations like purposing, deliberating, doing things, under the head of *will*. We broadly mark off these three sides of mind, and talk of men as exhibiting now one and now another aspect.

Feeling, Knowing, and Willing.—Mental science adopts this three-fold division. (1) Under *Feeling* we include all pleasurable and painful conditions of mind. These may be very simple feelings, having definite bodily causes, such as the painful sensations of hunger and thirst, or the pleasures of the palate. Or they may be of a more complex nature, such as love, or remorse. (2) *Knowing*, again, includes all operations which are directly involved in gaining knowledge, as, for example, observing what is present to the senses, recalling the past, and reasoning. (3) Finally, *Willing* or *Acting* covers all active mental operations, all our conscious doings, such as walking, speaking, attending to things, together with efforts to do things, active impulses and resolutions. The perfect type of action is doing something for an end or purpose; and this is what we ordinarily mean by a voluntary action.

Opposition between Knowing, Feeling, and Willing. — These three kinds of mental state are, as we have seen, in general clearly marked off one from another. A child in a state of strong emotional excitement contrasts with a child calmly thinking about something, or another child exerting his active powers in doing something. If we take any one of these aspects of mind in a well-marked form, we see that it is opposed to the other aspects. Thus strong feeling is opposed to and precludes at the time calm thinking (recollecting, reasoning), as well as regulated action (will). Similarly, the intellectual state of remembering or reasoning when fully developed at the moment is opposed to feeling and to doing. The mind can not exhibit each variety of function in a marked degree at the same time.

This opposition may be seen in another way. If we compare, not different states of the same mind, but different minds as a whole, we often find now one kind of mental state or operation, now another in the ascendant. Minds marked by much feeling (sensitive, emotional natures) commonly manifest less of the intellectual and volitional aspects or properties. Similarly, minds of a high degree of intellectual capability (inquiring or inquisitive minds), or of much active endowment (active minds), are as a rule relatively weak in the other kinds of endowment.

It follows from this that the training of the mind in any one of its three functions is to some extent a separate matter. Thus, intellectual education has its separate end, viz., the production of a quick, unerring intelligence, which end involves no proportionate development of the feelings or of the will.

Connection between Knowing, Feeling, and Willing.—Yet while knowing, feeling, and willing are thus broadly marked off from, and even opposed to, one another, they are in another way closely connected. A mind is not a material object which can be separated into distinct parts, but an organic unity made up of parts standing in the closest relation of interdependence. If we closely examine any case of feeling, we are sure to find some intellectual and volitional accompaniments. Thus when we experience a bodily pain (feeling), we instantly localize the pain or recognize its seat (knowledge), and endeavor to alleviate it (volition). Most of our feelings, as we shall see, are wrapped up with or embodied in intellectual states (perceiving, remembering, etc.). Again, intellectual operations, observing, thinking, etc., are commonly accompanied by some shade of agreeable or disagreeable feeling, and they always involve voluntary activity in the shape of attention or concentration of mind. Finally, willing depends on feeling for its motive or impelling force, and on knowledge for its illumination or guidance.

It will be seen from this that our threefold division of mind is a division according to the fundamentally distinct aspects which predominate at different times. Thus by intellectual states or processes we mean those modes of mental activity in which the cognitive function is most marked and prominent.

This fact of the invariable concomitance of the three mental functions is of capital importance to the teacher. Misled by our habits of analysis, and our abstract ways of thinking, we are apt to suppose that in training the intellectual faculties we may disregard the emotional and volitional element altogether. But a deeper insight into the organic unity of mind corrects this error. One great law governing our intellectual activity is that we attend to what interests us, that is, to what excites feeling in some way and, through this, arouses the energies of the will. And just as educators have sometimes failed to make the best of children's intellectual powers, by overlooking the necessary accompaniments of feeling and will, so they have failed to develop the highest type of will and character, because they have not recognized the dependence of this on a certain mode of intelligence, and on the development of particular emotions.

Species of Knowing, Feeling, and Willing: Mental Faculties.—Popular psychology recognizes certain divisions or species of knowing, feeling, and willing under the head of faculties, capabilities, or powers. More particularly we speak of intellectual *faculties* such as perception and imagination; emotional *capacities*, or susceptibilities, as love, anger; and active *powers* and dispositions, such as movement, choice, industry.

These distinctions are valid so far as they go. The psychologist allows that perceiving and remembering differ in certain important respects. The first operation contains elements (e. g., actual sense-impressions) which the second does not contain. Thus there is a real psychological distinction involved, and the psychologist will find it here as elsewhere convenient to make this popularly recognized distinction the starting-point in a scientific treatment of the phenomena of mind.

In adopting these popular distinctions, however, the psychologist must not be taken to imply that the several processes of perceiving, remembering, etc., are distinct one from the other fundamentally, that is to say, with respect to their elementary parts. While we set out with these well-marked divisions of faculty, we seek to discover by a deeper psychological analysis certain more fundamental or primary distinctions, and to regard such differences as those between perceiving and remembering as secondary.

Primary Intellectual Functions.—The essential operation in all varieties of knowing is the detecting of relations between things. I know a tree, a period of English history, a demonstration in Euclid, when I know its several parts in relation one to another, and also its relations as a whole to other things. The most comprehensive relations are difference or unlikeness and agreement or likeness. All knowing means discriminating one impression, object, or idea from another (or others), and assimilating it to yet another (or others). I perceive an object as a rose only when I distinguish its several parts and features one from another; and when, further, I see how it differs from other objects, and more especially other varieties of flower, and at the same time recognize its likeness to other roses previously seen. And so of other forms of knowing. Hence, discrimination and assimilation may be viewed as the primary functions of intellect.

While these two primary functions constitute the main factor in intellectual operations, the exercise of them presupposes other capabilities. Thus the power of taking apart the objects presented to the mind, and confining the attention to certain details or particulars (analysis), together with the supplementary power of mentally grasping a number of objects together at the same time (synthesis), is clearly implied in all knowing. This power will be dealt with under the head of *attention*. In addition to this, there is the mind's capacity of retention, that is, of conserving past impressions and recalling them for future use. Unless we could thus retain impressions, we should be unable to bring together before the mind facts lying in different regions of our experience, and so discover their relations. Moreover, the abiding knowledge of any subject plainly implies the retention of what we have learned.

Individual Differences of Mental Capability.— The several mental operations do not present themselves in precisely the same manner in all minds. They vary in certain respects, and these variations are referred to differences of mental power or capacity. Now, as we have seen, psychology as science has to do with the general facts and truths of mind. It takes no account of individual peculiarities. Nevertheless, the practical importance of estimating individual differences has led psychologists to pay considerable attention to this concrete branch of their subject. And the foregoing analysis of mental functions prepares the way for a scientific classification of individual differences.

There are different ways in which individual minds vary. Thus, one mind may differ from another in respect of one whole phase or side. For example, we speak of one child as more intellectual or more inquiring than another. Similarly, one child is said to have more emotional susceptibility or more active impulse or will than another.

Again, we may make our comparison more narrow, and observe how one mind differs from another with respect to a special mode of intellectual (or other) activity. Thus, to find that individuals vary in respect of one of the primary intellectual functions, that one has a finer sense of difference or a keener sense of resemblance than another. Or, once more, we may note and record differences in the strength of some particular faculty, as observation, or reason. Or, lastly, we may distinguish yet more narrowly, comparing individuals with respect to some special mode of operation of a faculty, as perception of form, or memory for words.

In like manner we can distinguish between different degrees of strength of a special emotion, as anger or affection, or of a particular active endowment, as endurance.

All the innumerable differences which characterize individual minds must ultimately resolve themselves into these modes. The problem of measuring these individual differences with something like scientific exactness will occupy us later on.

Truths or Laws of Mind.—The classification of mental states prepares the way for ascertaining the general truths of mind. The most comprehensive of these truths are known as laws of mind. These laws aim at setting forth in the most general form the way in which mental states are connected one with another, and particularly the way in which they succeed and act upon one another. The law that governs any mental operation unfolds the circumstances necessary to its accomplishment, in other words, its causal antecedents or conditions. It thus helps us to explain or account for the operation in any particular case.

Here, too, mental science is seeking to improve on popular psychology; for observation has long since taught men that mental products, such as knowledge and character, presuppose certain antecedent circumstances and influences. This is seen in the common sayings about mind and character, such as "Experience is the best teacher," "Love is blind," "First impressions last longest," etc.

General Conditions of Mental Activity.—Some of these laws of mind embody the general conditions of mental operations, whether those of feeling, knowing, or willing. Reference has already been made to the common physiological conditions of mental operations, viz., a vigorous state of the brain, etc. Among general mental conditions, attention is by far the most important. Attention is presupposed alike in all clear knowing, vivid feeling, and energetic willing. The laws of attention, to be spoken of presently, are thus in a manner laws of mind as a whole.

Conditions of Knowing, Feeling, and Willing.—Next to these universal conditions, there are the more special ones of knowing, of feeling, and of willing. Thus the laws of mental reproduction, or the revival of impressions, are in a peculiar manner laws of intellect. Similarly, there are laws of feeling which seek to formulate the conditions of pleasure and pain, as well as the effects of feeling on the thoughts and beliefs. Finally, we have special laws of willing, as, for example, that action varies with the intensity of motive force applied, that proximate satisfactions excite the will more powerfully than remote ones. It is to be added that in assigning the special conditions of feeling, knowing, and willing, we should refer to the particular nervous structures engaged, so far as these are known.

As truths of mind still more special, we have the enumeration of the several conditions of a particular variety of operation, such as the intellectual act of observation or imagination. This gives us the law of operation of that particular faculty. Thus we explain or account for observation by specifying its conditions, external and internal, such as the favorable position of the object, some special interest in it, etc. Here, too, we must include in our survey the regions of the nervous system specially engaged.

As already observed, this enumeration of co-operating conditions must in certain cases embrace remote as well as immediate antecedents. Thus, to account for a recollection, we need to refer not only to the suggestive forces acting at the time, but also to the influence of past experience in associating that which suggests with that which it suggests.

For a complete understanding of the way in which any variety of mental product arises, we need to take into account the action of the whole mental state at the time, so far as it is favorable or unfavorable. Thus, calmness of mind, freedom from emotional excitement, and preoccupation of the attention, is an important negative condition of the more difficult intellectual processes.

Finally, among the conditions of a perfect discharge of any mental function we presuppose a mind in which this power is strong and well developed. And it is often well to specify this. Thus, in setting forth the conditions of retention under any of its forms, such as the recollection of colors or places, we may specify a good natural retentive power in that particular direction.

Importance of understanding the Conditions of Mental Activity.—The understanding of the laws that control the various forms of mental activity is a matter of special consequence to the teacher. As already observed, we can only bring about any intellectual or other mental product when we see clearly into the conditions on which it depends. The educator, in seeking to exercise some faculty, say observation, is coming into a certain rapport with the pupil's mind. This relation is not like that of an external mechanical force to a passive material, as clay or sealing-wax. The teacher only succeeds in doing anything when he calls forth the learner's own mental activity. The very idea of stimulating the mind implies that the external agent calls forth a mental reaction, that is, excites the mind to its appropriate form of activity. Hence, the teacher needs to have, at the outset, the clearest knowledge as to what this activity is, and what laws it uniformly obeys. Thus, for example, he requires to understand what the mind really does when it thoroughly grasps and assimilates a new truth.

In the process of stimulating the mind the teacher necessarily employs certain agencies, and it is of the greatest importance that he rightly understand their precise effect in furthering the mental activity he would excite. Thus, in giving a child verses to commit to memory, he should know to what extent and in what precise manner this employment exercises the memory. And this he can only do when he has a clear scientific insight into the nature of the faculty and the laws of its operation. It is of great importance, too, that he should understand in what ways his appliances are liable to be counteracted by other influences, such as an unfavorable state of the pupil's mind at the moment.

In the appliances brought to bear by the educator there are two things to be distinguished: first of all, the material supply on which the pupil's mind is to exercise itself; and, secondly, the motive force brought to bear in order to induce the learner to apply his mind to the subject. A wise choice of material presupposes a certain knowledge of the intellectual faculties, and the laws which govern their operation. A wise selection of motive presupposes no less accurate a knowledge of the laws that rule in the domain of the feelings and the will.

APPENDIX.

The reader who desires to read further on the threefold division of mind is referred to my "Outlines of Psychology," chap. ii, and Appendix B; also, to the works of Sir W. Hamilton and Dr. Bain, there quoted, and to Dr. Ward's article "Psychology," in the "Encyclopædia Britannica."

On the corresponding divisions of educational work and the connections between them, the reader should consult Waitz, "Allgemeine Pädagogik," § 6; Dr. F. Dittes, "Grundriss der Erziehungs- und Unterrichtslehre," §§ 23, 24, and 86.

CHAPTER V.

MENTAL DEVELOPMENT.

Mental Development defined.—In the last chapter we were concerned with ascertaining the nature and conditions of the several kinds of mental operation, without any reference to the time of life at which they occur. But mental operations differ greatly in different periods of life, owing to what we call the growth or development of faculty or capacity. We have now to consider this far-reaching process of mental growth. We shall seek to distinguish between the successive stages of mental life, and point out how these are related one to the other. By so doing we may hope to account not merely for the single operations of a faculty, but for the mature faculty itself, viewed as the result of a process of growth. This part of our subject constitutes the theory of mental development.

When speaking of the physical organism, we distinguish between growth and development. The former is mere increase of size or bulk; the latter consists of structural changes (increase of complexity). While growth and development usually run on together, there is no proper parallelism between them. Thus, in abnormal growth, development is hindered. And an organ, as the brain, may develop long after it has ceased to grow. It is possible to apply this analogy to mind. We may say that mind grows when it increases its stock of materials. It develops in so far as its materials are elaborated into higher and more complex forms. Mere growth of mind would thus be illustrated by an increase in the bulk of mental retentions, that is, in the contents of memory: development, by the ordering of these contents in their relations of difference and likeness, and so on. But in general the two terms, mental growth and mental development, may be used as interchangeable.

The characteristics of mental development are best seen in the case of the intellect. The growth of knowledge may be viewed in different ways: (1) Under one aspect it is a gradual progress from vague to distinct knowledge. The perceptions and ideas grow more definite. This may be called intellectual *differentiation*. (2) Again, it is a progress from simple to complex processes. There is a continual grouping or *integration* of elements into organic compounds. In this way the child's knowledge of whole localities, of series of events, and so forth, arises. (3) Once more, it is a continual movement from external sense to internal thought or reflection. Or, as it is commonly described, it is a transition from the *presentative*, or what is directly presented to the mind through sense, to the *representative*, that which is indirectly set before the mind by the aid of internal ideas. (4) Lastly, this progress from sense to thought is a transition from the knowledge of individuals to that of general classes, or from a knowledge of concrete things to that of their abstract qualities.*

This aggregate of changes, which constitutes the growth of mind, appears to resolve itself into two parts. On the one hand we see that the several faculties which operate in the case of the child have expanded and increased in vigor. On the other hand we notice that new faculties,

* Reference is made here only to knowledge of outer things. As will be seen by-and-by, the growth of self-knowledge illustrates the same movement from outer sense to internal reflection, from the concrete to the abstract.

the germs of which are hardly discoverable in the child, have acquired strength. We see, that is to say, that while the faculties have each grown singly, there has been a certain order of unfolding among them, so that some have reached mature vigor before others.

Growth of Faculty.—The growth or improvement of a faculty includes three things, or may be regarded under three aspects: (1) Old operations become more perfect, and also more easy and rapid. Thus the recognition of an individual object, as a person's face, as also the recalling of it when absent, tends to become more distinct, as well as easier, with the repetition of the operation. This is improvement of a faculty in a definite direction. (2) New operations of a similar grade of complexity will also grow easier. Thus the improvement of the observing powers (perception) includes a growing facility in noting and recognizing unfamiliar objects; that of memory includes a greater readiness in retaining and recalling new impressions. This is improvement of a faculty generally. (3) This general improvement is completed by the attainment of the capability of executing more complex, intricate, and difficult operations. Thus the growth of memory means the progress of the capability as shown in retaining and recalling less striking impressions and larger and more complex groups of impressions.

Order of Development of Faculties.—One of the most valuable doctrines of modern psychology is that there is a uniform order of development of the faculties. There is a well-marked order in the growth of intellect. (1) The process of attaining knowledge sets out with sensation, or the reception of external impressions by the mind. Sense supplies the materials which the intellect assimilates and elaborates according to its own laws. Before we can know anything about the material objects which surround us they must impress our mind through the senses (sight, touch, hearing, etc.). (2) Sensation is followed by perception, in which a number of impressions are grouped together under the form of a percept, or an immediate apprehension of some thing or object, as when we see and recognize an orange or a bell. (3) After perception comes representative imagination, in which the mind pictures, or has an image of, what has been perceived. It may represent this either in the original form (reproductive imagination), as when we recall the face of a friend; or in a new form (constructive imagination), as when we imagine some historical personage. (4) Finally, we have general or abstract knowing, otherwise marked off as thinking. This includes conception, or the formation of concepts or general notions out of percepts and images, such as "metal," "organism," "life," and so on; judgment, or the combination of concepts, as when we assert that no men are omniscient; and reasoning, or the combination of judgments, as when we conclude that a particular writer, say a journalist, is not omniscient, because no men are so.

Unity of Intellectual Development.—It has already been pointed out that modern psychology seeks to reduce the several operations of perception, imagination, etc., to certain fundamental processes, of which discrimination and assimilation are the most important. By help of this deeper analysis of intellectual activity we are able to regard the successive unfoldings of the faculties as one continuous process. The higher and more complex operations of thought now appear as only different modes of the same fundamental functions of intellect that underlie the lower and simpler operations of sense-perception. Thus the simplest germ of knowing involves the discrimination of sense-impression; and the highest form of knowing, abstract thinking, is a higher manifestation of the same power. Again, the perception of a single object is a process of assimilating present to past impressions; and abstract thinking is assimilating or classing many objects under certain common aspects. We may thus say that the several stages of knowing, viz., perception, conception, and so on, illustrate the same fundamental activities of intellect employed about more and more complex materials (sensations, percepts, ideas, etc.).

We thus see that there are no breaks in the process of intellectual development. It is one continuous process, from its simplest to its most complex phase. The distinctions between perception, imagination, etc., though of great practical convenience, as roughly marking the successive stages of growth, must not be taken as answering to sharp divisions. The movement of intellectual progress is not a series of separate leaps, but one unbroken and even movement.

Growth and Exercise of Faculty.—The great law underlying these processes of development is that the faculties or functions of intellect are strengthened by exercise. Thus the power of observation (perception), of detecting differences among colors, forms, and so on, improves by the repeated exercise of this power. Each successive operation tends to improve the faculty, and more particularly in the particular direction in which it is exercised. Thus, if the power of observation is exercised with respect to colors, it will be strengthened more especially in this direction, but not to the same extent in other directions, e. g., with respect to forms.

Again, since perception, conception, and so forth, are only different modes of the same intellectual functions, the exercise of these in the lower form prepares the way for the higher manifestations. Thus, in training the senses, we are calling into play the power of analyzing a complex whole into its parts, also the functions of discrimination and assimilation, and so are laying the foundations of the higher intellectual culture. On the other hand, we must not suppose that by merely exercising the observing powers we can secure a development of the powers of abstract thought. In order that the successive phases of intelligence may unfold themselves, the separate exercise of the fundamental functions in each of these phases is necessary. That is to say, we require a special training for each of the faculties in due order.

Growth and Retentiveness.—This growth of intellect by exercise implies retentiveness. By this term, in its widest signification, is meant that every operation of mind leaves a *trace* behind it, which constitutes a *disposition* to perform the same operation or same kind of operation again. This truth obviously underlies the generalization, "Exercise strengthens faculty." The increased power of observation, for example, due to repeated exercises of the faculty, can only be accounted for by saying that each successive exercise modifies the mind, adding to its capability of acting, and strengthening its tendency to act in that particular mode.

Growth and Habit.—This persistence of traces, and formation of a disposition to think, feel, etc., in the same way as before underlies what we call habit. By this term, in its most comprehensive sense, is meant a fixed tendency to think, feel, or act in a particular way under special circumstances. The formation of habits is a very important ingredient of what we mean by intellectual development; but it is not all that is so meant. Habit refers rather to the fixing of mental operations in particular directions. Taken in this narrow sense, habit is in a manner opposed to growth. By following out a train of ideas again and again in a certain way, we lose the capability of varying this order, of re-adapting the combination to new circumstances. Habit is thus the element of persistence, of custom, the *conservative* tendency; whereas growth implies flexibility, modifiability, susceptibility to new impressions, the *progressive* tendency. We shall again and again have to distinguish between the effect of habit, as understood in this narrow sense, and development in the full sense, as a wide or many-sided progress. The importance of the principle of habit will be illustrated more especially in the domain of action.*

In order that the intellectual powers as a whole may be exercised and grow, a higher form of retentiveness is needed. The traces of the products of intellectual activity must accumulate and appear under the form of revivals or reproductions. The impressions of sense, when discriminated, are in this way recalled as mental images. This retention and revival of the products of the early sense-discrimination is clearly necessary to the higher operations of thought. Images, though the product of elementary processes of discrimination and assimilation, supply in their turn the material for the more elaborate processes of thought. We thus see that the growing complexity of the intellectual life depends on the accumulation of innumerable traces of past and simpler products of intellectual activity.

Grouping of Parts: Laws of Association.—Closely connected with this fundamental property of retentiveness, there is another involved in this process of intellectual development. The growth of intellect, as we have seen, leads to an increasing complexity of the products. This means that the several elements are combined or grouped in certain ways. This grouping goes on according to the laws of association. These laws will be fully discussed by-and-by. Here it is enough to say that there are two principal modes of grouping, and corre-

* The term *habit* is commonly confined to actions which have grown customary, and so mechanical. But the principle of habit is illustrated in each of the three directions of mental development. Some writers distinguish between passive habits, the effects of custom on feeling, and active habits, its effects on action. In connection with education, Locke uses the term *habit* generally as expressing the result of practice. See "Thoughts concerning Education," edited by Rev. R. H. Quick; Introduction, p. liv.

sponding laws of association of mental elements, (*a*) according to their nearness or contiguity in time, and (*b*) according to their similarity. The first mode will be the one principally illustrated in the earlier stages of development (perception and imagination); the second, the one mainly concerned in the later stages (thought).

Development of Feeling and Willing.—While, for the sake of simplicity, we have confined our attention to the development of intellect, it is necessary to add that the same features and the same underlying principles are discoverable in the growth of feeling and will. The earlier feelings (bodily pleasures and pains) are simple and closely connected with the senses: the higher feelings (emotions) are complex and representative in character. Again, the first actions (bodily movements) are simple and external, being immediate responses to sense-impressions, whereas the later are complex, internal and representative (choosing, resolving, etc.). It will be found, further, that there is a continuity of process throughout the development of each. And the same laws or conditions, growth by exercise, retentiveness and association, are illustrated here as in the case of intellectual development.

Interdependence of Processes.—We have so far viewed the growth of intellect, of feeling, and of volition as processes going on apart, independently of one another. And this is in a measure a correct assumption. It has, however, already been pointed out that mind is an organic unity, and that the processes of knowing, feeling, and willing in a measure involve one another. It follows from this that the developments of these phases of mind will be closely connected. Thus, intellectual development presupposes a certain measure of emotional and volitional development. There would be no attainments in knowledge if the connected interest (curiosity, love of knowledge) and active impulses (concentration, application) had not been developed. Similarly, there can be no development of the life of feeling without a considerable accumulation of knowledge about Nature and man; nor can there be any development of action without a development of feeling and the accumulation of a store of practical knowledge. The mind may develop much more on one side than on the others, but development on one side without any development on the others is an impossibility.

This connectedness of one side of development with the others may be illustrated in the close dependence of intellectual growth on the exercise and improvement of the power of attention. Though related to the active or volitional side of mind, attention is a prime condition of intellectual operations. Mental activity includes in every case some form of attention; and the higher kinds of mental activity illustrate the full exercise of the will in the shape of an effort of concentration. This being so, intellectual growth, which, as we have seen, is the immediate outcome of mental activity, is closely dependent on the development of will. It is the improvement of the power of voluntary concentration which makes successively possible accurate observation, steady reproduction, and all that we mean by thinking.

This dependence of one phase of mental development on the other phases is not, however, equally close in all cases. Thus the growth of knowing involves comparatively little of the emotional and volitional element. The growth of feeling in its higher forms involves considerable intellectual development, but no corresponding degree of volitional development. Finally, the growth of will is largely dependent on that of knowing and feeling. Hence, in the order of exposition, we set out with the development of knowing, passing then to that of feeling, and finally to that of willing.

Growth and Development of the Brain.—Just as, in studying mental operations at a particular time, we have to include in our view nervous concomitants, so in studying mental development we must ask what changes in the nervous organism, and more particularly in the brain-centers, accompany these psychical changes.

The brain, like all other parts of the organism, *grows* in bulk or size, and *develops* or manifests certain changes in its formation or structure, viz.: increasing unlikeness of parts and intricacy of arrangements among these. The two processes, growth and development, do not progress with the same degree of rapidity. The size nearly attains its maximum about the end of the seventh year, whereas the degree of structural development reached at this time is not much above that of the embryonic condition.* It may be added that the higher centers of thought and volition develop later than those of sensation.

The brain, being an organ closely connected with the rest of the bodily organism, would tend to grow to a certain extent with the growth of the organism as a whole, and independently of any activity of its own. But such growth would be rudimentary only. Like all other organs, it grows and develops by exercise. This physiological law is clearly the counterpart of the psychological law that exercise strengthens faculty. Such exercises tend to modify the brain structures in some way, so as to dispose them afterward to act more readily in the same manner.[2]

Factors in Development.—The process of mental growth just traced out is brought about by the co-operation of two sets of agencies or factors—the mind itself which develops, and the circumstances necessary to its development. These may be marked off as the internal and the external factor.

(A) Internal Factor.—This consists first of all of the simple and fundamental capabilities of the mind. Thus it includes the several simple modes of sensibility to light, sound, and so on. Further, it embraces the fun-

* See Bastian, "The Brain as an Organ of Mind," p. 375.

damental intellectual functions, discrimination, and assimilation. In like manner it will include the primary or fundamental capacities of feeling, and powers of willing. The internal factor includes, too, the mind's native impulse to activity and spontaneous tendency to development.

(B) External Factor. (1) Natural Environment.—In the second place, the development of an individual mind implies the presence and co-operation of the external factor, or the environment. By this we mean, in the first place, the physical environment or natural surroundings. The growth of intelligence presupposes a world of sights and sounds, etc., to supply the materials of knowledge. The mind of a child deprived of these would languish for want of its appropriate nutriment. Similarly, the development of the feelings, for example, of fear, awe, the sense of beauty, etc., depends on the presence and action of natural objects. Finally, the will is called forth to activity by the action of the forces of the natural environment, and by the need of reacting on it and modifying it.

(2) The Social Environment. — In addition to what we commonly call the natural or physical environment, there is the human and social environment. By this we mean the society of which the individual is a member, with which he holds certain relations, and by which he is profoundly influenced. The social medium, like the physical, affects the individual mind through sense-impressions (sights and sounds) ; yet its action differs from that of the natural surroundings in being a *moral* influence. It works through the forces which bind the individual to other individuals and to the community, such as imitation, sympathy, and the sentiment of obedience or authority.

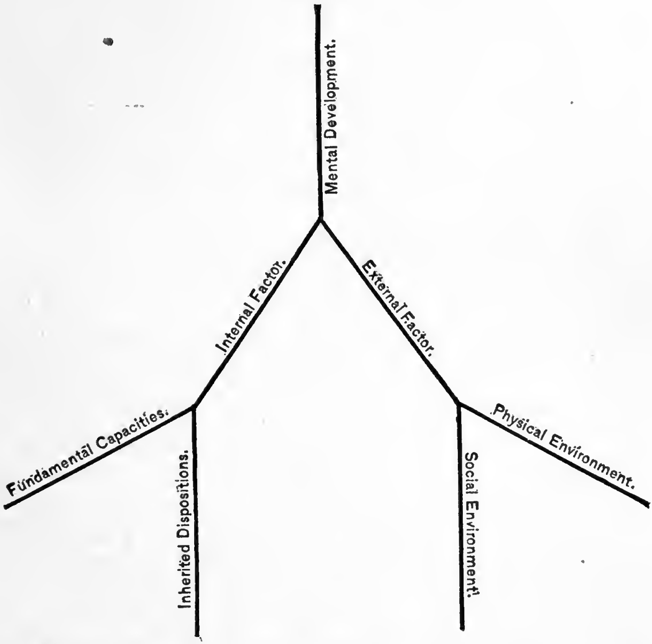
The presence of a social medium is necessary to a full normal development of mind. If it were possible to maintain a child in bodily health and at the same time deprive him of all companionship, his mental development would be but rudimentary. The child comes under the stimulation, the guidance, and the control of others, and these influences are essential to a normal mental development. Thus, his intellectual growth is determined by continual contact and interaction with the social intelligence, the body of knowledge amassed by the race, and expressed in everyday speech, in books, etc. Similarly, the feelings of the child quicken and grow under the touch of social sentiment. And finally the will is called forth, stimulated and guided by the habitual modes of action of those about him. These social influences embrace a wider area as life progresses. Beginning with the action of the family, they go on expanding by including the influences of the school, of companions, and finally of the whole community, as working through manners, public opinion, and so forth.

Undesigned and Designed Influence of Society.—A part of this social influence acts undesignedly, that is, without any intention to accomplish a result. The effects of contact of mind with mind, of example, of the prevailing tone of a family or a society, all this resembles the action of natural or physical agencies. On the other hand, a considerable remainder of this influence is clearly designed. To this part belong all the mechanism of instruction, the arts of suasion, moral and legal control, etc.

Both kinds of social influence co-operate in each of the three great phases of mental development. Thus the intellect of a child grows partly under the influence of contact with the social intelligence reflecting itself in the structure of language; and partly by the aid of systematic instruction. Similarly, feeling develops partly through the mere contact with other minds, or the agencies of sympathy, and partly by direct appeals from others. Finally, the will develops partly by the attraction of example and the impulses of imitation, and partly by the forces of suasion, advice, reproof, and the whole system of moral discipline.

Scheme of Development.—The reader may perhaps be able the better to comprehend the above rough theory of mental development by help of the following diagram:

Fig. 4.



Varieties of Development.—While all normally constituted minds pass through the same typical course of development, there are endless differences in the details of the mental history of individuals. In no two cases, indeed, is the process of mental growth precisely similar. These diversities of mental history answer to the differences between mind and mind spoken of in the previous chapter. Such differences of development may be referred to one or two causes of factors: (*a*) variations or inequalities of original capacity, or (*b*) differences in the external circumstances, physical and social. All differences in the final result, that is, the mature or developed aptitude or capacity, must be assignable to one (or both) of these factors.

It is important to observe that differences of original capacity include all inequalities in mental energy and capability of development. As every teacher knows, the instruments of education applied to two children, at approximately the same level of attainment, result in widely unlike amounts of progress. Such inequalities in capability of mental growth turn mainly on differences in the degree of mental activity, and, next to this, on different degrees of retentive power.

Differences of Original Capacity.—In ascertaining these we must be careful to separate off only what is strictly original, and not in any measure the result of previous training or other kind of external influence. Now, we can not altogether eliminate the effect of early influences; yet we can reduce this to a minimum by taking the child soon enough, or by selecting for our experiment a sufficiently new mode of mental operation.

Such a method of comparative measurement applied to young children would undoubtedly confirm the everyday observation of parents and teachers alike, that children are at birth endowed with very unequal degrees of capacity of different kinds. Each individual has his particular proportion of aptitudes and tendencies, which constitute his *nature* or his natural character, as distinguished from his later and partly acquired character. This natural character is doubtless very closely connected with the peculiar make of his bodily, and more particularly his nervous organism. The condition of the sense-organs, of the brain, of the muscular system, and even of the lower vital organs, all serves to determine what we call the native idiosyncrasy or temperament of the individual.

The Law of Heredity.—According to modern science these original differences are, in part at least, illustrations of the principle of heredity. This principle states that physical and mental peculiarities tend to be transmitted from parents to children. Just as bodily features reappear in parents and children, so intellectual and moral traits persist in the shape of inherited mental dispositions. These are handed down in connection with certain peculiarities of the brain and nervous system.

Common and Special Heredity.—The principle of heredity manifests itself in different ways. In one sense we may say that our common human nature, with its typical physical organism and its several mental susceptibilities and capabilities, is inherited, that is, transmitted to each new member of the species. But, as customarily employed, the term heredity refers to the transmission of physical or mental peculiarities which have somehow been acquired by the individual's ancestors. This transmission of acquired characteristics assumes a wider or a narrower form. Its widest range is seen in the alleged fact that the offspring of civilized races have from the first a higher intellectual and moral endowment than those of uncivilized, having certain original or instinctive dispositions to think, feel, and act in the ways that have become habitual with civilized mankind. According to this view, as civilization progresses and education improves, native capacity tends to slowly increase, and this gradual increase constitutes one factor in the upward progress of the species. Again, members of one particular race or nationality, as Celts or Frenchmen, appear to inherit distinct physical and mental traits. Still more plainly the members of one family may often be observed to present similar mental as well as bodily characteristics through a number of generations. These mental peculiarities are partly intellectual, partly emotional, and partly active, referring to differences in strength of will, etc. An interesting example of this is occasionally to be met with in the transmission of a definite kind of talent through generations of a given family, as, for example, of musical talent in the Bach family.*

It is evident, however, that the members of one family show marked diversities as well as similarities. We often remark very striking contrasts of ideas, feelings, and inclinations among children of the same family. Such contrasts may sometimes be only another illustration of the action of heredity, some members of the family representing certain ancestral traits, other members, other traits. But this can not be safely maintained in the majority of instances. In the present stage of our knowledge of the subject, heredity only helps us to account for a comparatively few among the host of peculiarities which go to make up the natural basis of an individual character. We have to recognize along with this another tendency, namely, to individual variation.

Varieties of External Influence.—While original peculiarities of nature or temperament thus play a considerable part in individual development, they are not the sole agency at work. Differences in the surroundings, physical and still more social, have a good deal to do with the differences of ability and character that we find among individuals.

The important thing to bear in mind here is that no two individuals ever come under the same influences. Even twins, who are born into the same family at the same time, have an unlike social environment from the first. Their own mother is hardly likely to feel toward them or to treat them in quite the same way; and others show this divergence of feeling and behavior very much more. As life progresses, the sum of external influences, serving to

* For fuller illustrations of such transmission of definite ability, see Mr. F. Galton's work, "Hereditary Genius"; *cf.* Prof. Th. Ribot's volume, "On Heredity."

differentiate individual character, increases. The school, the place of business, the circle of friends, and so on, all help to give a peculiar stamp to the individual mind.

That even such slight differences in surroundings must produce an effect follows from psychological laws. The mind grows on what it assimilates. The lines of its growth will be to some extent predetermined by innate capabilities and tendencies; but these only broadly limit the process, they do not fix its precise character. The particular ideas and connections of ideas formed, the intellectual habits fixed, the peculiar coloring of the feelings, and the special lines of the conduct will all be determined by the character of the surroundings.

It is impossible, in the present state of our knowledge, to say how much of the diversity of intelligence and character that we find among men is referable to native differences, how much to the effects of surroundings, more particularly social surroundings. The older psychology of Locke overlooked the effects of native differences, of individual nature. To Locke all men were born with equal abilities, and the differences were due to experience and education. The newer psychology rightly insists on the existence of these original differences, on the effects of "nature" as distinguished from "nurture." * There is no doubt that similar experiences and outer influences do not produce precisely identical results. At the same time, it is possible that we of to-day are apt to underesti-

* The importance of original differences of intellectual aptitude and emotional disposition has just been insisted on with great force of argument by Mr. F. Galton in his curious volume, "Inquiries into Human Faculty and its Development." See "Nurture and Nature," p. 177, etc. An illustration of the strength and pertinacity of original tendencies is very clearly brought out in the "History of Twins," p. 216, *et seq.* Mr. Galton takes cases of twins who were much alike, and also of twins who were distinctly unlike, and he seeks to show that in both cases the final result is largely determined by nature and not by nurture.

mate the effects of surroundings, and more particularly of early bringing up. It is true, of course, that there never is anything in the finished mental product, the mature mind and character, which was not present potentially at the outset. It is also true that all growth is the immediate outcome of the mind's own exertion and activity. Still, it may be said that the special external circumstances of the individual life were needed to evoke and nurture these latent germs of ability, and to call forth and direct that activity.

It is common to say that men of genius are independent of their surroundings, that their powers germinate and fructify in spite of unfavorable surroundings. This is true in a sense. The stronger the native intellectual bent, the more strenuous the mental exertions, the more independent is the mind of its surroundings; or, to put it more accurately, the more readily will it create a favorable environment (companions, books, etc.) for itself. In average cases, however, when there is no such powerful and predominant impulse, it is the actual surroundings, and particularly the early influences of the home and the school, which determine which of the potential aptitudes and inclinations shall be fostered into life and vigor.[3]

The Teacher and the Social Environment.— From the foregoing we see that education fulfills an important function among the influences presupposed in development. The intellectual and moral culture of the home constitutes a prime ingredient in the sum of the influences of the social environment. The influence of the school-teacher, though much more restricted on the emotional and moral side, is the most important of the external stimuli to intellectual progress. As Pestalozzi has pointed out, the teacher stands in place of the parent, having to carry forward, in a more thorough and systematic manner, and to a much higher point than the qualifications and the opportunities of the parent commonly allow, the early intellectual instruction of the home; and, regarded in this light, his work is eminently a natural one, being the outgrowth of the instinct of instruction which shows itself in germ in the lower animals, and in man is inseparately intertwined with the parental feelings and instincts. Viewed in another way, the teacher represents not merely the parent but the community. This he does by aiming at preparing the learner in intelligence, and, as far as possible, in character, to properly fill his future place in the community; and by bringing to bear for this purpose all the resources of the knowledge which has become the heritage of the present from the past, as well as a type of character which represents as clearly as possible the highest moral progress yet attained by man.[4]

Training of the Faculties.—The systematic procedure of the teacher is implied in the word training. This involves the putting of the child in such circumstances, and surrounding it by such influences, as will serve to call the faculty into exercise, or, as has already been pointed out, the supplying of the intellect with materials to work upon, or nutriment to be assimilated, together with the application of a stimulus or motive to exertion. It means, too, the continuous or periodic exercise of the faculty, with the definite purpose of strengthening it, and advancing its growth.

Such training must clearly be based on a knowledge of the laws of mental development. Thus it has to conform to the great law of all growth, that it is appropriate exercise which strengthens faculty. That is to say, it will aim directly at calling forth a faculty into its proper mode of action by supplying materials and motives adapted to the stage of development reached at the time. Training may be said to be adapted when it supplies an adequate but not excessive stimulation of the faculty. By adequate stimulation is here meant an excitation of sufficient strength and variety to secure completeness of growth. A boy's memory or understanding is not properly trained if very easy tasks are assigned which fail to rouse the faculty to full activity. By excessive stimulation is meant an amount of excitation which forces the activity to such a point as is unfavorable to growth. Thus, when a boy is set to master a problem in Euclid beyond his powers of reasoning the task, by baffling effort and confusing the mind, is distinctly adverse to intellectual progress. It follows that all good training must be progressive, the tasks becoming more difficult *pari passu* with the growth of ability.

In the second place, the whole scheme of training should conform to the natural order of development of the faculties. Those faculties which develop first must be exercised first. It is vain, for example, to try to cultivate the power of abstraction, by subjects like grammar, before the powers of observation (perception) and imagination have reached a certain degree of strength. This self-evident proposition is one of the best accepted principles in the modern theory of education, though there is reason to apprehend that it is still frequently violated in practice.

Once more, a method of training based on scientific principles will aim not only at taking up a faculty at the right moment, but also at cultivating it up to the proper point, and not beyond this. By this point is meant the level which answers to its rank or value in the whole scale of faculties. Thus, for example, in training the memory or the imagination we should inquire into its precise importance in relation to the attainment of knowledge and intellectual culture as a whole, and give to its exercise and development a proportionate amount of attention.

The perfect following out of this principle is that harmonious development of the whole mind on which Pestalozzi and others have laid emphasis. The educator must ever keep before him the ideal of a complete man, strong and well-developed physically, intellectually, and morally, and, so far as practicable, assign a proportionate amount of time and exercise to the development of each side of the child's being.[5]

Finally, training, in order to be adequate, must be to some extent elastic, adapting itself to the numerous differences among young minds. Up to a certain point a common result, namely, a typical completeness of development, will be aimed at. It would not be well, for example, that any child, however unimaginative, should have his imagination wholly untrained. At the same time this typical plan of cultivation must be modified in detail. The greater the natural aptitude, the more economical the production of a given psychical result. Hence it would be wasteful to give as much time and thought to the training of a bad as of a good germ of faculty. Nor do the practical ends of life impose such a disagreeable task on the teacher. Variety of individual development is in itself valuable, and moreover answers to the highly elaborated division of life-work or differentiation of life-function which characterizes civilization. The problem of respecting individuality in educating the young, of securing a sufficient diversity of studies in our school system, is probably one of the most urgent practical educational problems of the hour. (See Notes 6 and *6a.*)

APPENDIX.

For a fuller account of the nature and causes of mental development the reader is referred to Mr. Spencer's "Principles of Psychology," especially vol. i, parts iii and iv. A brief account of the process as bearing on education will be found in the same writer's essay, "Education," chap. ii. His views have been criticised by M. H. Joly, "Notions de Pédagogie," p. 48, etc., and by W. H. Payne, "Contributions to the Science of Education," chap. iv. The subject has also been discussed from an educational point of view by Beneke, "Erziehungs und Unterrichtslehre," i, p. 101, etc.; G. F. Pfisterer, "Pædagogische Psychologie," § 2; and Dittes, "Grundriss," § 22. The determining forces in development are given by Waitz, "Allg. Pæd.," § 4; Rosenkranz, "Pæd. as System," p. 23, etc.; T. Ziller, "Vorlesungen über Allg. Pæd.," pp. 49 and 60; and Guyau, "Education et Hérédité," chap. i and ii.

CHAPTER VI.

ATTENTION.

Place of Attention in Mind.—Attention enters as an important condition into all classes of mental operation. There is no distinct thinking, no vivid feeling, and no deliberate action without attention. This co-operation of attention is specially conspicuous in the case of *intellectual* operations. The objects which present themselves to our senses are only clearly discriminated one from the other, and classed as objects of such and such a class, when we attend to them. So again, present impressions only exercise their full force in calling up what is associated with them when we keep them before the mind by an act of attention. Once more, all abstract thinking is clearly an active state of mind involving a voluntary fixing of the attention. We thus see that attention, though a form of action, and in its higher developments presupposing an effort of will, stands in the closest relation to intellectual operations. It is co-operation of the active side of mind in intellectual processes, and it is one of the great determining forces of intellectual development. This being so, it is desirable to give a brief account of it before entering on the exposition of intellect, reserving the exposition of its higher forms till we come to consider the nature of volition.

Definition of Attention.—Attention may be roughly defined as the active self-direction of the mind to any material or object which presents itself to it at the moment.* It thus means somewhat the same as the mind's "consciousness" of what is present to it. The field of attention, however, is narrower than that of consciousness. I may be very vaguely or indistinctly conscious of some bodily sensation, as hunger, of some haunting recollection, and so on, without making it the object of attention. Attention involves an intensification of consciousness, a concentration or narrowing of it on some definite and restricted portion of the mental scene; or, to express it otherwise, it implies a turning of the mental eye in a particular direction so as to see the objects lying in that quarter as distinctly as possible.†

As an active tension of mind, attention is opposed to that relaxed state of mind in which there is no conscious exertion to fix the gaze on any particular object. This answers to what the teacher is wont to call inattention. It is a state of listlessness or drowsiness as compared with one of activity and wakefulness.

Directions of Attention.—Attention follows one of two main directions; that is, is directed to one of two great fields of objects. (1) The first region is that of external impressions, the sights, sounds, etc., which make up the world of sense. When the teacher talks about "attending," he commonly means actively listening, or actively looking. This is the direction of attention outward, or external attention. (2) In addition to external impressions, internal images, ideas and thoughts, may be attended to. This constitutes the second main direction of attention, or internal attention. All intellectual atten-

* The reader must be careful to distinguish between "object of attention" and "external object," as we commonly understand it. As we shall see presently, the former, though including the latter, is a much wider domain than this.

† The idea of mental activity in the full sense, or mental tension, is directly suggested by the etymology of the word, *ad tendere*, to stretch (sc., the mind toward).

tion, that is to say, attention engaged in the processes of learning or coming to know about things, is attention directed either to external impressions or to internal ideas. So far as we attend to feelings of pleasure and pain we appear to do so by fixing the attention on the exciting cause of the feeling, which must be either an external object or an internal idea. Finally, in attending to our actions, we fix our minds on the idea of the result which we are immediately aiming at. Thus, in every case, the object of attention is some external impression, or internal idea, or thought.

Effects of Attention.—The immediate effect of an act of attention serves to give greater force, vividness, and distinctness to its object. Thus an impression of sound, as the tolling of a bell, becomes more forcible, and has its character made more definite, when we direct our attention to it. A thought, a recollection, is rendered distinct by attending to it. The intensification of consciousness in one particular direction produces thus an increase of illumination, and so subserves the clear perception and understanding of things.

Attention produces striking effects on the feelings. A serious bodily injury may hardly trouble our mind, if through some exceptional excitement it is hindered from attending to it. Thus it is known that soldiers wounded in battle have hardly felt any pain at the moment. On the other hand, a very moderate sensation of discomfort, as an irritation of the skin, grows into something intensely disagreeable if the attention is fastened on the particular bodily locality affected. Finally, our actions grow more vigorous and energetic as well as more precise when we give our attention to the objects aimed at.*

Physiology of Attention.—The seat of attention appears to be situated in the higher region of the nerve-

* For some curious illustrations of the effects of attention, see Dr. Carpenter's "Mental Physiology," chap. iii.

centers in the cerebral hemispheres. The mechanism of attention probably involves an intensification of nervous activity in certain regions of the brain, which is effected by means of an impulse sent forth from the supreme controlling centers. In this way, for example, the nerve-centers employed in hearing are thrown into a state of exceptional excitability when we listen to somebody reading or singing. Along with this concentration of nerve-energy in certain definite regions of the brain, the act of external attention involves important muscular adjustments, such as directing the eye to an object, which are necessary to the reception of distinct sense-impressions.[7]

Extent of Attention.—All attention is a narrowing of the range of mental activity and to a certain extent a concentration or focusing of the mind on a given point. But all acts of attention do not embrace equal areas or extents. Just as in looking at a landscape we may fix the eye on a smaller or larger portion of the scene, so the mind may direct itself to a smaller or larger area of object.

In general it may be said that the more things we try to include in our mental gaze the less distinct is the result. This is seen plainly in all efforts to attend to a variety of disconnected things at one time, as when we are reading a book and listening to a conversation. "One thing at a time" is the law of mental activity, and the performing of distinct mental occupations is only possible where repetition and habit exempt us from close attention, as in carrying on some familiar manual operation and listening to another's words.

Where, however, we have to do with a number of connected impressions or objects of attention, we are able to a certain extent to include them in one view. Thus we can attend to the features of a face in their relations of proportion, to a succession of musical sounds in their relations of rhythm, etc. This grasp of a number of parts, details, or members of a group, is greatly facilitated by a rapid transition of the mental glance from one detail to another, as in running over the various features of an artistic design, or the succeeding steps of an argument.

On what the Degree of Attention depends.—The amount of attention exerted at any time depends on two chief circumstances: (*a*) the quantity of nervous energy disposable at the time; (*b*) the strength of the stimulus which excites the attention or rouses it to action. If there is great active energy, a feeble stimulus will suffice to bring about attention. A healthy, vigorous child, in the early part of the day, has a superabundance of energy which shows itself in attention to small and comparatively uninteresting matters. Indeed, his activity prompts him to seek objects of attention in his surroundings. On the other hand, a tired or weakly child requires a powerful stimulus to rouse his mental activity.

External and Internal Stimuli.—The stimulus to an act of attention may be either something external, connected with the object attended to, or something internal. An external stimulus consists of some interesting or striking feature in the object itself, or in its accompaniments, by reason of which the attention is said to be attracted and arrested, as when a child's attention is excited by the brilliance of a light, or the strangeness of a sound. An internal stimulus is a motive in the mind which prompts it to put forth its attention in a particular direction, such as the desire of a child to please his teacher, or to gain a higher place in his class.

Non-Voluntary and Voluntary Attention.—When the mind is acted upon by the mere force of the object presented, the act of attention is said to be non-voluntary.* It may also be called reflex (or automatic) because it bears

* The term non-voluntary is preferred to involuntary, as indicating the mere absence of volition, and not opposition to will or "unwillingness."

a striking analogy to reflex movement, that is to say, movement following sensory stimulation without the intervention of a conscious purpose. On the other hand, when we attend to a thing under the impulse of a desire, such as curiosity or a wish to know about a thing, we are said to do so by an act of will, or voluntarily. These two modes of attention, though properly distinguished one from another, are both *acts* of the mind, and will be found to shade off one into the other in our actual mental life.

Reflex Attention.—This is the earlier form of attention, and the one with which the teacher is specially concerned in the first stages of instruction. Here the direction of the attention is determined for the mind rather than by the mind. It follows the lead of the attractive force which happens to work at the time.

In its simplest form attention is a momentary direction of the attention due to the action of a powerful sensory stimulus, as a brilliant light, a loud sound, etc. Every teacher knows the value of a strong emphatic mode of utterance in commanding the attention ; and this effect is partly due to the action of strong sensuous impressions in rousing mental activity.

Law of Contrast and Novelty.—This momentary direction of the attention is governed by the law of change or contrast. According to this principle, an unvarying impression, if prolonged, fails to produce a mental effect. The constant noise of the mill soon ceases to be noticed by one who lives near it. This is partly due to the fact that a prolonged powerful stimulus fatigues the nerve-center and renders it less responsive. But, in addition to this, a prolonged impression, even if a powerful one, loses its effect because it ceases to exert an attractive force on the attention. Hence, the teacher who continually or very frequently addresses his class in loud tones, misses the advantage of an occasional raising of the voice.

On the other hand, a sudden change of impression, as when a light is brought into a dark room, or the report of a gun breaks the stillness of the country, acts as a powerful excitant to the attention. For the same reason a strong contrast of impression, as between high and low, soft and loud in music, bright and dark colors, and so forth, is an excitant to the attention.

Novelty, so powerful a force in childhood and a considerable force throughout life, is only a further illustration of the law of change. For something new attracts the attention, because it stands in contrast with our ordinary surroundings and experience. It stimulates and excites the mind very much as a startling contrast.

Interest.—When it is said that we only attend to what interests us, there is a reference to the excitation of a certain amount of *feeling*. This feeling acts as a force in arresting the attention and keeping it fixed for an appreciable time. Attention to what interests us is thus always something more than the momentary direction of attention. This feeling of interest may arise in different ways.

(1) In the first place, interest is excited when the object is in itself pretty or beautiful, and so fitted to give immediate pleasure or gratification in the very act of attending to it. Thus, an infant will keep its eyes fixed for a time on the lamp brought into the room, because of its pleasurable effect. The production of pleasure, in connection with any mode of activity, tends, as we shall see by-and-by, to intensify and prolong this activity. This forms the germ of æsthetic interest.

(2) Another great source of interest in things is their connection with what is pleasurable or painful in our past experience. The infant shows the most vivid interest in such sights as the preparation of its food, its bath, etc. A child will listen to whatever bears on its familiar pleasures, its favorite possessions and companions, its amusements, etc. In all states of fear, again, we see the attention closely engaged by that which bears on pain or suffer-

ing. This effect of a connection or association with what is pleasurable or painful in riveting the attention underlies what we mark off as practical interest.

(3) Lastly, interest may assume a more distinctly intellectual form, involving the germ of a wish to understand a thing, and the desire for knowledge as such. This intellectual interest is what we commonly call curiosity. It springs up in different ways. It arises most naturally out of a feeling of wonder at what is new, strange, and mysterious, as when a child sees a light go out in a bottle filled with carbonic acid, and wants to know the cause. In many cases, however, it takes its rise in the feeling of delight produced by what is beautiful, as when a child is interested in knowing about a lovely flower or bird. Finally, this intellectual interest is greatly promoted by the principle of association. The direction of children's curiosity follows to a large extent the lead of association. What is seen to have a bearing on the child's pleasures and practical aims tends to become the object of a genuine intellectual curiosity.

Familiarity and Interest.—It follows from this that mere novelty, though a powerful stimulus to the attention, and capable of leading on to curiosity, is rarely if ever sufficient to detain and fix the attention in a prolonged act or attitude. What is absolutely strange and consequently unsuggestive to the child's mind is apt to be a matter of indifference. In walking down a new street, for example, a child will as a rule notice those things which in some way remind him of, and connect themselves with, what he already knows and likes, e. g., the harness in the saddler's shop.* While, therefore, the principle of change tells us that perfect familiarity with a subject is fatal to interest, the laws of intellectual interest tell us that a measure of familiarity is essential. The principle

* See the interesting account of the want of interest in London sights manifested by some Esquimaux who visited our capital, given by Miss Edgeworth, "Practical Education," ii, p. 118.

of modern intellectual education, that there should be a gradual transition from the known to the unknown, is thus seen to correspond not only with the necessities of intellectual movement and development, but also with the natural laws of development of those feelings of interest which inspire attention and so call the intellectual faculties into play.[8]

Transition to Voluntary Attention.—The development of interest and curiosity forms a natural transition from non-voluntary to voluntary attention. The prolongation of the act of attention implies a germ of volition. Thus the maintenance of the expectant attitude of mind by a class, when the teacher is presenting interesting materials, is due to a vague anticipation of coming gratification and a desire to realize this. Here, then, we see how gradually the earlier and lower form passes into the later and higher. In supplying interesting matter to his class, and exciting a feeling of pleasurable interest, the teacher is preparing the way for the exercises of the will in what is called voluntary attention.

Function of the Will in Attention.—It is impossible at this stage to explain the whole nature of voluntary attention. As a mode of will or volition it obeys the laws of volition, which will be expounded later on. Here it must suffice to indicate the effects of voluntary action in enlarging the sphere and otherwise modifying the character of attention.

To begin with, then, what is called voluntary attention is not a wholly new phase of the process. After the action of the will has supervened, the forces of non-voluntary attention continue to be active as *tendencies*. And the range of the will's action is limited by these. Thus the student most practiced in abstraction finds that there is some force of external stimulus, as the allurement of a beautiful melody sung within his hearing, against which his will is impotent.

Again, though we can undoubtedly (within certain limits) *direct* our attention in this or that quarter at will, we have not the power to keep our attention closely and persistently fixed on any object which we (or somebody else for us) may happen to select. Something further is necessary to that lively interaction of mind and object which we call a state of attention ; and this is interest. By an act of will a person may resolve to turn his attention to something, say a passage in a book. But if, after this preliminary process of adjustment of the mental eye, the subject-matter opens up no interesting phase, no effort of volition will produce a calm, settled state of concentration. The will introduces mind and object : it can not force an attachment between them. No compulsion of a teacher ever succeeded in making a young mind cordially embrace and appropriate by an act of concentration an unsuitable, and therefore uninteresting subject. We thus see that voluntary attention is not removed from the sway of interest. What the will does is to determine the kind of interest which shall prevail at the moment.

The importance of this initial action of will, in determining the direction of attention, depends on the fact that in many cases a strong interest is only developed after the mind and the subject-matter have remained in contact awhile. Many subjects do not disclose their attractions at once and on the surface, but only after they have been more closely examined. Thus the charm of a poem or of a geometrical problem makes itself felt gradually. Hence, if a child can be induced to exercise his will at the outset, under the influence of some internal motive disconnected with the subject, as the desire to please his parents or teacher, or to gain some tangible advantage from the study, he will often come under the spell of new and unsuspected varieties of interest. Indeed, the taking up of any new branch of study illustrates this gradual substitution of an easy, agreeable activity for a comparatively hard and disagreeable one.

Growth of Attention: Early Stage.—After this account of the nature and laws of attention and its two chief forms, a few words will suffice to indicate the successive phases of its growth. As has been observed, the early form of attention is the reflex or non-voluntary. By frequent exercises of its activity in response to external stimuli the power attains a certain degree of development independently of any aid from the will. By this is meant that, after a certain number of exercises, less powerful stimuli suffice, in the absence of more powerful ones, to call forth attention. Thus, by directing his attention again and again to bright objects, as the candle, the infant is preparing to direct it (still non-voluntarily) to the mother's face, his own hands, etc., when these objects happen to come into the field of view. With the progress of life, too, many things at first indifferent acquire an interest. Thus the accompaniments of what is intrinsically interesting would acquire (according to the principle of association) a borrowed or derived interest. In this way the infant tends to watch the movements and doings of his nurse, mother, etc.; the boy comes to take an interest in the construction of his kite, and so on. Not only so, the range of interesting objects would be greatly extended by the development of new feelings, such as the sense of the grotesque, the feeling for what is beautiful, affection, etc.

Development of Power of controlling the Attention.—While this exercise of the power of attention in the reflex form is thus going on, the child's will is also developing. The simplest manifestation of voluntary attention may perhaps be found in the *continued* gazing at an agreeable object, such as a brightly colored toy or picture, held before the eye; for here, as pointed out above, there is a vague anticipation of further pleasure. A more distinctly marked development of will-power is manifested in the attitude of expectation. From a very early period of life the will begins to manifest itself in a deliberate exploring or looking out for objects to inspect or examine.* By such successive exercises the activity of attention is little by little brought under perfect control. Although the full understanding of this process presupposes a knowledge of the growth of will as a whole, we may be able to anticipate to some extent, and indicate the main lines of this progress.

The growth of voluntary attention means a continual reduction of the difficulty of attending to objects. The law that exercise strengthens faculty applies to attention. What is first done with labor and sense of difficulty is, with repetition and practice, done more and more easily. At the same time more and more difficult tasks become possible. The growth of attention may be best treated by distinguishing between the several forms in which this progressive mastery of difficulty manifests itself.

Attention to the Unimpressive.—Voluntary attention is obviously a going beyond the range of powerful and directly interesting stimuli, and an embracing of a wider circle of comparatively unimpressive and only indirectly interesting objects. The progress of attention can be measured under this aspect. The child learns gradually to fix with his eye the less striking, prominent, and attractive objects and events of the world in which he lives. When no strongly impressive objects are present, the very impulse of activity will insure a certain amount of attention to less conspicuous and striking ones. Moreover, each successive exercise of the attention makes subsequent exercises easier, and the growth of mind as a whole implies

* Prof. Preyer says that the child begins to explore the field of vision in search of objects before the end of the third month. (" Die Seele des Kindes," p. 33.) He puts the first appearance of volition, properly so called, a month or two later. This suggests that the simple action here spoken of is a transition from the reflex to the voluntary form of attention. On the other hand, M. Perez thinks he discovers the germ of voluntary attention at the age of two months and six days. (" The First Three Years of Childhood," p. 112.)

the constant addition of new needs and impulses which would insure a wider range of attention.

Resistance to Stimuli.—A voluntary control of the attention involves, in the second place, the ability to resist the solicitations of extraneous and distracting objects. Voluntarily to turn the mind to a thing is to exclude what is irrelevant. This power of resistance has, of course, in every case its limits. Nobody can withstand the disturbing force of a sudden explosion. But the capability of resisting such distractions varies considerably, and is greatly improved by practice. The child, when sent to school, finds it hard at first not to look at his companions, or out of the window, when a lesson is being given. By-and-by he will be able to fix his mind on his lesson, even when some amount of disturbing noise is present. The highest attainment of this power is seen in the student whose mind is "abstracted" from external impressions, being wholly absorbed in internal reflection.

Keeping the Attention fixed.—Another aspect, under which the growth of attention may be estimated, is the ability to detain objects before the mind. As we have seen, reflex attention is, for the most part, a process of flitting from object to object. We found, indeed, that even here there is a force at work which tends to counteract the impulse to skip from one thing to another. But this would not of itself carry us very far. It is only as the attention comes under the control of the will that it shows any considerable measure of persistence. To attend to a thing voluntarily means commonly to *keep* the mind dwelling on it. The ordinary school exercises involve such a prolonged and sustained effort of attention. Thus, in counting, the mind has to keep steadily in view the result of each of the successive operations as it is reached. The wandering of the thoughts for an instant would be fatal to the achievement of the whole process. So, in following a description, a demonstration in Euclid, and so forth.

Here, again, we have to recognize the existence of certain limits in every case. Nobody can fix his mind on one and the same object—say a geometrical figure—for an indefinite time. When once the fresh interest of a thing is exhausted, a further fixing of the attention costs more and more effort. Nor can a pupil carry on a sustained effort of attention through an indefinitely long arithmetical or other operation. The brain is soon wearied by the prolonged exertion, and attention flags in spite of the utmost effort. But the limit of fatigue is pushed further off as the will develops and the act of attention becomes more easy.

Concentration.—The power of sustained attention grows with the ability to resist distractions and solicitations. The two capabilities are thus very closely connected with one another, and are both included in the term *concentration.* To concentrate the mind is to fix it persistently on an object or group of objects, resolutely excluding from the mental view all irrelevant objects. The great field for the early exercises of such concentration is action. When the child wants to do something, as open a box, or build a pile of bricks, the strong desire for the end secures a prolonged effort of attention. The scholar patiently poring over a mutilated passage in an ancient MS., to the neglect of his appetite, or the naturalist patiently observing the movements of insects or of plants, indifferent to cold and wet, illustrates a high power of prolonged concentration. A person's power of attention may be conveniently measured by the degree of persistence attained.

Concentration and Intellectual Power.—It has often been said that great intellectual power turns on the ability to concentrate the attention. Newton based his intellectual superiority on this circumstance. Helvetius observed that genius is nothing but a continued attention. A proposition about which there is so general an agreement among those who ought to know may be safely accepted as expressing a truth. Attention is a condition of all intellectual achievement, and a good power of prolonged concentration is undoubtedly indispensable to first-rate achievement in any direction. The discoverers of new knowledge have always been distinguished by an unusual degree of pertinacity in brooding over a subject, and in following out trains of thought in this and that direction till the required explanation of fact, reconciliation of apparent contradictions, and so on, was found. But though these sayings undoubtedly embody an important truth, they only contain a part of the whole truth. No amount of attention simply will constitute intellectual eminence. The dull, slow, but exceedingly plodding child is a familiar type to the teacher. Success of the higher order depends on the possession of the intellectual functions (discrimination, etc.) in an exceptionally perfect form. On the other hand, good intellectual powers, when aided by a comparatively small power of prolonged attention, may render their possessor quick and intelligent.

Grasp of Attention.—As was pointed out above, the mind has a certain power of including a number of objects in one glance, and this power underlies the apprehension of all relations, such as symmetry of form, similarity between objects, etc. The acquisition of this grasp is one of the most valuable results of the growth of the power of voluntary attention. Only as this power is developed will it be possible for the teacher to take his pupil on to the higher intellectual exercises, such as the understanding of geometrical relations of the more complicated kind, the processes of comparing a number of things with a view to abstraction, the logical analysis of sentences, arguments, and so forth. This form of attention, like the other forms, needs its own special modes of exercise to develop and improve it.

We must distinguish this power of carrying the attention quickly over a number of connected details from another variety of attention closely akin to it, viz., the capability of transferring the mental glance from one thing to another and disconnected thing. This capability is illustrated in a striking form in the rapid movements of the versatile mind from one subject of conversation, one region of ideas to another. This power of rapid transference, though valuable in many intellectual exercises, is of far less value than the power of mentally bringing a number of details together as parts of one whole. It is plain, too, that it is in a manner opposed to prolonged concentration upon one subject.

Habits of Attention.—Voluntary attention, like voluntary action as a whole, is perfected in the form of habits. By a habit we mean a fixed disposition to do a thing, and a facility in doing it, the result of numerous repetitions of the action. The growth of the power of attention may be viewed as a progressive formation of habits. At first voluntary concentration of mind requires a spur and an effort. As soon as the pressure of strong motive is withdrawn, the young mind returns to its natural state of listlessness or wandering attention. A habit of attention first appears as a recurring readiness to attend under definite circumstances, for example when the child goes into his classroom, or is addressed by somebody. This is what Miss Edgeworth calls a habit of associated attention. Later on there manifests itself a more permanent attitude of attentiveness. The transition from childhood to youth is often characterized by the acquisition of a more general attitude of mental watchfulness, showing itself in thoughtfulness about what is seen and heard. The highest result of the working of the principle of habit in this region is illustrated in the customary, and but rarely relaxed, alertness of mind of the artistic or scientific observer of nature.

Varieties of Attentive Power.—It has been implied that the power of attention develops very unequally in different individual cases. With some this power never reaches a high point at all; these are the children of sluggish attention, the "saunterers," to use Locke's expression, who form the teacher's crux. Again, owing to differences of native endowment, as well as of exercise, we find well-marked contrasts in the special direction which the attentive power assumes. And these help, to a considerable extent, to determine the cast or character of the individual intelligence. Everybody knows the difference, for example, between the plodding child, able to concentrate his mind on an object for a long period, but slow to transfer and adjust his attention to new matter, and the quick but rather superficial child—the volatile genius, according to Miss Edgeworth, who finds it easy to direct his attention to new objects, though hard to keep it fixed for a prolonged period. There are many students who are capable of great intensity of concentration under favorable circumstances, but whose minds are easily overpowered by disturbing or distracting influences. Finally, the ruling habits of attention will vary according to the character of the predominant interests. Thus, for example, a strong love of nature (whether scientific or artistic) will give a habitual outward bent to the attention; whereas a paramount interest in our own feelings, or in the objects of imagination and thought, will give a customary inward inclination to the attention.

Training of the Attention.—All intellectual guidance of the young manifestly implies the power of holding their attention. Instruction may be said to begin when the mother can secure the attention of the infant to an object by pointing her finger to it. Henceforth she has the child's mental life to a certain extent under her control, and can select the impressions which shall give new knowledge or new enjoyment. What we mark off as formal teaching, whether by the presentation of external objects for inspection through the senses, or by verbal instruction, clearly involves at every stage an appeal to the attention, and depends for its success on securing this. To know how to exercise the attention, how to call forth its full activity, is thus the first condition of success in education.

Mental science here, as in respect of the other faculties, can only point out the general conditions to be observed, and the natural order of procedure. It is plain, in the first place, that the laws of attention must be complied with. He would be a foolish teacher who gave a child a number of disconnected things to do at a time, or who insisted on keeping his mind bent on the same subject for an indefinite period. Yet, though these conditions are obvious enough, others are more easily overlooked. Thus it is probable that a more exact knowledge of the effects on the attention of novelty of subject and mode of treatment, on the one hand, and of total unfamiliarity on the other hand, would save teachers from many errors. Some of us can recall from our school-days the wearisome effect of an oft-recurring stereotyped illustration, as well as the impression of repellent strangeness produced by a first, and too sudden, introduction to a perfectly new branch of study.

In the second place, it will be well to bear in mind that the young child's power of voluntary attention is rudimentary only, and that force must be economized by removing all obstacles and making the task as attractive and agreeable as possible. It would be idle to try to enlist his close attention if he were bodily fatigued, or if he were under the influence of emotional excitement, and agitated in mind and body. Again, it would be vain to expect him to listen to oral instruction close to a window looking out on a busy street. Children's (uncontrolled) attention flows outward to the sights and sounds of the actual external world, and is less easily diverted by the teacher's words toward the world of imagination and thought.

Consequently, in teaching, everything should be done to reduce the force of outward things. The teacher would do well to remember that even so practiced a thinker as Kant found it helpful to prolonged meditation to fix his eye on a familiar and therefore unexciting object (a neighboring church-spire). Not only so, the subject and mode of treatment chosen should be such as to attract the learner's attention to the utmost What is fresh, interesting, or associated with some pleasurable interest, will secure and hold the attention when dry topics altogether fail to do so. Much may be done in this direction by preparation, by awakening curiosity, and by putting the child's mind in the attitude of tiptoe expectancy.

As the pupil grows, more may of course be required in the shape of a voluntary effort to attend. It must never be forgotten, however, that all through life forced attention to what is wholly uninteresting is not only wearying, but is certain to be ineffectual and unproductive. Hence, the rule to adapt the work to the growing intellectual and other likings of the child. Not only so, the teacher should regard it as an important part of the training of the attention to arouse interest, to deepen and fix it in certain definite directions, and gradually to enlarge its range.* Harder task-work, such as learning the comparatively uninteresting letters of the alphabet, or the notes of the musical scale, must be introduced gradually, and only when the will-power is sufficiently developed. Great care must be taken further to graduate the length or duration of the mental application, both in a particular direction and generally, in accordance with the progress of the child's powers of voluntary attention. An ideal school-system would exhibit all gradations in this respect ;

* Volkmann remarks that the older pædagogic had as its rule, "Make your instruction interesting"; whereas the newer has the precept, "Instruct in such a way that an interest may awake and remain active for life" ("Lehrbuch der Psychologie," vol. ii, p. 200).

alternation and complete remission of mental activity being frequent at first, and growing less and less so as the powers of prolonged concentration develop.

APPENDIX.

On the early development of attention, see Perez, "First Three Years of Childhood," chap. viii. The characteristics of children's attention and the laws of the growth of attention are well described by Waitz, "Lehrbuch der Psychologie," § 55; and by Volkmann, "Lehrbuch der Psychologie," vol. ii, § 114.

On the training of the attention, see Locke, "Some Thoughts concerning Education," § 167; Maria Edgeworth, "Essays on Practical Education," vol. i, chap. ii. Beneke, "Erziehungs- und Unterrichtslehre," 4th ed., vol. i, § 19; Th. Waitz, "Allgemeine Pædagogik," vol. i, § 23; and G. Compayré, "Cours de Pédagogie," leçon v. The effects of a lively mode of presenting subjects of instruction in exciting and detaining attention are well brought out by Mr. Arthur Sidgwick in his lecture on "Stimulus" ("Three Lectures on the Practice of Education"—Pitt Press Series). Cf. F. W. Parker, "Notes of Talks on Teaching," xxiv.

CHAPTER VII.

THE SENSES: SENSE-DISCRIMINATION.

All knowledge takes its rise in the senses. No intellectual work, such as imagining or reasoning, can be done till the senses have supplied the necessary materials. These materials, when reduced to their elements, are known as sensations or impressions, such as those of light and color, which we receive by means of the eye, of sound, which we have by way of the ear, and so on. An examination of our most abstract notions, such as force, matter, leads us back to these impressions of sense. Our ideas respecting the nature and properties of things is limited by our sensations. The want of a sense, as in the case of one born blind, means depriving the mind of a whole order of ideas. The addition of a new sense, if such a thing were possible, would enrich our minds by a new kind of knowledge respecting the world.[9]

Definition of Sensation.—A sensation being an elementary mental phenomenon can not be defined in terms of anything more simple. Its meaning can only be indicated by a reference to the nervous processes on which it is known to depend. Accordingly, a sensation may be defined as a simple mental state resulting from the stimulation of the outer extremity of an "incarrying" nerve, when this stimulation has been transmitted to the brain-centers. Thus the stimulation of a point of the skin by pressing or rubbing, or of the retina of the eye by light, gives rise to a sensation.

These sensations have two broadly distinguishable aspects, one of which is commonly predominant. The first is the *emotional* aspect, by which is meant the presence of a distinct element of feeling, pleasurable or painful. A sensation of bodily warmth, or of sweetness, illustrates this prominence of the element of feeling. The second aspect is the *intellectual*, or knowledge-giving. By this is meant the presence of definite and clearly distinguishable properties, which may be called marks or characters, because they serve as clews to the qualities of external things. The sensation experienced on touching a smooth surface, or on hearing a sound of a particular pitch and loudness, is an example of the predominance of the intellectual element.

General and Special Sensibility.—All parts of the organism supplied with sensory nerves, and the actions of which are consequently fitted to give rise to sensations, are said to possess sensibility of some kind. But this property appears under one of two very unlike forms. The first of these is common to all sensitive parts of the organism, and involves no special nervous structure at the extremity. The second is peculiar to certain parts of the bodily surface, and implies special structures or "organs." To the former is given the name common or general sensibility, and also organic sense; to the latter, special sensibility, or special sense.

The sensations falling under the head of common sensibility, or the organic sense, are marked by absence of definite characters. They are vague and ill-defined. Their distinguishing peculiarity is that they have a marked pleasurable or painful aspect. Such are the feelings of comfort and discomfort connected with the processes of digestion and indigestion, and with injuries to the tissues. These sensations are not directly connected with the action of external objects, but arise in consequence of a certain condition of the part of the organism concerned. Thus they give us no knowledge of the external world. They are no doubt important as informing us of the condition of the organism ; but, owing to their vagueness, they give us very little *definite* knowledge even of this.

The special sensations are those we receive by way of the five senses. They are marked off one from another by great definiteness of character. This peculiarity is connected with the fact that each sense has its own specially modified structure or "sense-organ" such as the eye, or the ear, fitted to be acted upon by a particular kind of stimulus (light-vibrations, air-waves, etc.). Owing to this definiteness of character, the special sensations are much more susceptible of being discriminated and recognized than the organic sensations. Moreover, these sensations are (in ordinary cases) brought about by the action of *external* agents or objects lying outside the organism, and are on that account called impressions, or, better, sense-impressions.* For these reasons they are fitted to yield us knowledge of the environment.

Characters of Sensations.—The importance of the special senses depends, as we have seen, on their possessing certain well-defined aspects, whereby they are fitted to be marks of qualities in external objects as well as of the changes which take place in these. The two most important distinctions of character among our sensations are those of degree and of kind.

By degree or intensity is meant a difference of strength, as that between a bright and a faint light, or a loud and a soft sound. All classes of sensation exhibit such differences of degree. They are of great importance for knowledge. Thus the degree of pressure of a body on the hand helps to tell us of its weight.

By a difference of kind or quality is meant one of nature, as that between sour and sweet, blue and red. These

* The sense-impression which we are here concerned with is a *mental* phenomenon, and must not be confused with the *physical* "impression," as, for example, the image of an object on the retina.

too are marks of external facts. Thus we distinguish objects by their colors, voices by their pitch, etc.

The Five Senses.—Coming now to the senses in detail, we see that they do not all exhibit the same degree of definiteness or the same number of distinct characters. We usually speak of taste and smell as the coarse or unrefined senses, whereas hearing and sight are highly refined. By attending simply to the degree of refinement, we may arrange the senses in the following ascending order: taste, smell, touch, hearing, sight. A few words on the special function of each must suffice here.

Taste and Smell.—These present a decidedly low measure of refinement. Indeed, the sensations of these senses may be said to approach the organic sensations in want of definiteness, and in the predominance of the element of feeling (pleasure and pain). These peculiarities are connected with the fact that these senses have as their function the determination of what is wholesome or unwholesome to the organism as a whole. The very position of the organs, at the entrance of the digestive and respiratory cavities, suggests that they are sentinels to warn us as to what is good or ill. The sensations of taste and smell are easily confused one with another, and can not be definitely distinguished either in degree or quality. For this and other reasons, they are of little importance as knowledge-giving senses. It is only under special circumstances, as those of the chemist, the wine-taster, and so on, that these "servants of the body" supply a quantity of exact knowledge about the properties of external objects.

Touch.—By the sense of touch is meant the sensations we receive through the stimulation of certain nerves terminating in the skin by bodies in contact with it. These are either sensations of mere contact or pressure, or those of temperature.

These supply important elements of feeling. Thus, contact with smooth surfaces and with warm bodies is one chief source of sensuous pleasure, especially in early life.

The chief importance of touch is, however, under its intellectual aspect. In its highest form as it presents itself at definite portions of the bodily surface, more particularly the hands, and especially the finger-tips (with which the lips may be reckoned), the tactile sensibility becomes a most important means of ascertaining the properties of bodies. The sensations of touch have a much higher degree of definiteness than those of taste and smell.

The discrimination of degrees of pressure by the tactile sense is estimated by laying a weight on the hand or some other part, and then trying how much must be taken away or added in order that a difference may be felt.* It is found that the discriminative sensibility varies considerably at different regions of the bodily surface. For instance, on the anterior surface of the fingers the difference of pressure detected is about one half of that recognized on their posterior surface.

This discrimination of degrees of pressure by the skin is one of the means by which we obtain knowledge of the force exerted by bodies, e. g., the difference when a heavy and a light body press against us. It also assists in giving us information respecting the weight of bodies.

In the case of touch we have a further difference of sensation which may be called local distinction of sensation, or local discrimination. By this is meant the fact that we can distinguish a number of similar touches when different points of the skin are stimulated. This discrimination of points, like that of degrees of pressure, varies at different parts of the bodily surface. It is much finer in the mobile parts of the body (hands, feet, lips, etc.) than

* If the hand is the part selected, it must be supported by some object, as a table. Only in this way can we test the *tactile* sensibility to pressure apart from the *muscular* sensibility to be spoken of presently.

in the comparatively fixed parts (the trunk). Again, it is finer on the anterior than on the posterior surface of the hand, and decreases rapidly as we recede from the finger-tips toward the wrist and elbow. We see from this that the finger-tips are specially marked out as the organ of tactile sensibility.*

This local separation of tactile sensations is of the greatest consequence for knowledge. First of all, it is this capability, added to the discrimination of pressure, which forms the basis of our tactile discrimination of roughness and smoothness. A very rough surface, such as that of a piece of unplaned wood or of sand-paper, is appreciated as such by differences of pressure corresponding to eminences and depressions at various points of the surface. In estimating a rough surface, therefore, we must both distinguish the several points and the degrees of pressure at these. The sense of roughness and its opposite in their various degrees is of importance in ascertaining not only the nature of a surface, but also the texture of a substance, as the fibrous texture of wood, woven materials, etc.

In the second place, this local discrimination forms the foundation of the tactile knowledge of what is called extension, or the extendedness of outer things, by which is meant the fact that they have parts occupying different positions in space; as well as the various modifications of this extendedness which constitute differences of form and magnitude in objects, as differences of direction and length of line, form and extent of surface, etc. It is by laying the hand or the two hands on the surface of an object, such as a book, that we learn something of its figure and size.

Finally, under touch is commonly included the sense of temperature or the thermal sense. It is now known that this sensibility is connected with special nerve-structure

* The tip of the tongue and the lips are also highly endowed with tactile discrimination.

distinct from those of the tactile sense proper, and not varying in the same way as this varies at different portions of the bodily surface. Hence the thermal sense is a separate sense. At the same time, we usually test the temperature of bodies by touching them, and this with the fingers. And the appreciation of temperature thus takes place in close connection with that of their tangible properties. The child learns to know a metal and to distinguish it from wood partly by the differences in the thermal sensations.*

Active Touch.—So far we have considered touch merely as a passive sense, i. e., as sensibility to the action of things on the tactile surface. But the fact that we speak of touching bodies as our own action shows that it is an active sense as well. In touching, we ourselves bring the organ into contact with substances, and so secure its exercise. In other words, the organ is supplied with muscles, the action of which is of very great importance as enlarging the range of our experience and knowledge.

The first and most obvious advantage of this adjunct of muscular activity is the multiplication of tactile impressions. Just as the mobility of the insect's antennæ enables it to gain many more impressions of touch than it would have if the organs were fixed, so the mobile arm, hand, and fingers of the child greatly extend the range of his tactile experiences. By such movements he is able to bring the most sensitive part of the organ (the tips of the fingers) into contact with a large number of objects, and further to gain impressions of these in rapid succession, and so discriminate them better one from the other.

This widening and perfecting of passive impressions is,

* This knowledge is less valuable than that of form or weight, partly because sensations of temperature are very variable, depending on the temperature of the organ itself, and partly because the temperature of bodies is a changing state, and not a fixed, invariable property, as weight.

however, only one part of the gain resulting from the high degree of mobility of the hand and the eye. Another and no less important part is the new experience which accompanies these movements, and which constitutes a distinct and very important source of knowledge. This experience is known as the muscular sense.

Muscular Sense.—By this expression is meant the sum of those peculiar "sensations" of which we are aware when we voluntarily exercise our muscles. These have well-marked characters of their own. They constitute distinctly active states. In singing, in moving the arm or leg, in pushing a heavy body, we have a sense of being bodily active, or of exerting muscular energy.

The muscular sense is important both as a source of pleasure and as a means of knowledge. The child delights to exercise his muscles, to feel his bodily power. Certain modes of muscular exercise, as rapid rhythmical movement, are known to be specially exhilarating. It is, however, chiefly as a source of knowledge that we shall now regard it.

The sensations which accompany muscular action may be conveniently divided into two main varieties. These are (*a*) sensations of movement or of unimpeded energy, and (*b*) sensations of strain or resistance, that is, of obstructed or impeded energy. The first are illustrated in the sensations which attend movements of the arms or legs in empty space; the second are exemplified in the sensations which accompany the act of pushing against a heavy object, or holding a heavy weight in the hand.

(*a*) Sensations of movement present two well-marked differences of quality: (1) In the first place, they vary in character according to the *direction* of the movement. The movement effected by one muscle or group of muscles is felt to be unlike that carried out by another. Thus the sensations attending the movements of the arm to the right and to the left, up and down, are qualitatively unlike. And it is this difference in the sensations which enables us to ascertain what is the particular direction of any movement which we are executing. (2) In the second place, these sensations vary in character according to the *velocity* of the movement. The experience of moving the arm quickly differs materially from that of moving it slowly. And we are able to distinguish many degrees of velocity.

(*b*) The sensations which arise when muscular energy is impeded, as when we push with the shoulder or arms against a heavy body, drag it, or lift it, have a distinct character of their own. They have been called sensations of resistance, or "dead strain." They exhibit, like those of movement, nice distinctions of degree. We experience a difference of sensation in pushing a heavy table and one less heavy, and in lifting a pound and twenty ounces.

Each of these modes of muscular experience constitutes an important additional source of tactile knowledge. In truth, our information respecting the most fundamental properties of things would be very vague and rudimentary but for the addition of the muscular sense.

In the first place, it is the sensations of resistance which give the child its immediate knowledge of the deepest and most characteristic property of material things, viz., what is known as impenetrability, under its various modes, as hardness, density, inelasticity, etc. The mere sense of pressure gained by way of an immobile organ, say a paralyzed limb, could never supply any distinct knowledge of this property; this is directly revealed in the experience of exerting our own energy and finding it impeded by a force other than our own. All our customary estimates of the degrees of hardness, etc., of substances, are arrived at by the aid of muscular discrimination. Further, the discrimination of weight, though possible to a certain extent by way of passive touch, is much more accurate when the muscular sense is called in to help. If a person wants to estimate a weight nicely, he lifts it and judges by means of the degree of force he has to expend in so doing.

In the second place, the sensations of movement are an important factor in the knowledge of the extendedness of things, of the relative position of points, and of the shape and size of objects. The rudimentary and vague knowledge obtainable by means of the local discrimination of the skin needs to be rendered distinct and exact by means of movement. Thus, as any one can prove for himself, the idea of the shape and size of a small pencil, or of a ring, is made much clearer when we pass the finger-tip along it or round it, and so judge of it by the direction and length of the movements. The blind habitually examine the form of objects by the aid of movement.

Hearing.—The sense of hearing ranks high both as a source of pleasure and as an intellectual or knowledge-giving sense. The sensations which form the material of music, those of pitch, together with their combinations in rhythm, melody, etc., are among the most agreeable of our sense-experiences. But the refined pleasures of music presuppose intellectual capability in the shape of the discrimination of notes, etc. The intellectual value of hearing is due to the high degree of definiteness of its sensations. In respect both of intensity and of quality fine differences are recognizable.

The high intellectual character of hearing shows itself very conspicuously in the qualitative differences among sensations of sound. We have here the broad contrast between musical and non-musical sounds or noises. The former depend on regularly recurring or periodic vibrations of the air, the latter on irregularly recurring or non-periodic vibrations. In the case of musical sounds we have the remarkable phenomenon of a *scale* of quality. If we pass upward from a low note to a higher one through all distinguishable gradations, we experience a continuous variation of sensation which is known as that of pitch or height. These differences of pitch answer to changes in the rate of vibration of the medium (the atmosphere); the higher the note, the more rapid are the vibrations. Our musical scale is made up of distinct steps or intervals of this continuous series of gradual changes.

Along with this scale of pitch-quality, there are the differences known as timbre or "musical quality." These are the qualitative differences in sensations of tone answering to differences in the instrument, as the piano, the violin, the human voice.

In addition to this wide range of musical sensation the ear distinguishes a vast number of non-musical sounds, the characteristic "noises" of different substances, such as the roar of the sea, the rustling of leaves, and the crack of a whip. We distinguish noises as jarring, grating, explosive, and so on. It is this side of hearing which is of value for the knowledge of external things. The child learns to recognize the characteristic sounds produced by moving objects, as the plash of water, the rumbling of wheels, etc.

Finally, there are what are known as articulate sounds, those which constitute the elements of speech. These differ from one another partly in point of musical quality. Thus, it has been recently ascertained that the several vowel-sounds differ from one another in much the same way as the tones of different musical instruments. On the other hand, the differences of consonantal sounds are non-musical in character. In the ordinary classification of these into the gutturals, sibilants, etc., we find differences analogous to those among noises.

Enough has been said to illustrate the high degree of refinement characterizing the sense of hearing. The delicate and far-reaching discrimination of quality, aided by the fine discrimination of duration, enables the ear to acquire a good deal of exact information, as well as to gain a considerable amount of refined pleasure. The delight of music sums up the chief part of the latter. The former is illustrated in the wide range of knowledge derived by way of that system of articulate sounds known as language.

As a set-off against these advantages, we see that hearing has very little local discrimination. We can not distinguish two or more simultaneous sounds with any nicety according to the position of their external source. Nor is the organ of hearing endowed with mobility as the hand is. Hence, hearing gives us no direct knowledge of the most important properties of objects, their size and shape.

Sight.—The sense of sight is by common consent allowed the first place in the scale of refinement. To this fact there corresponds the delicate and intricate structure of the organ, and the subtile nature of the stimulus (ether-vibration). The eye surpasses all other sense-organs both in the range and in the delicacy of its impressions. These are at once the source of some of the purest and most refined enjoyment, the pleasures of light, color, and form, and of some of the most valuable of our knowledge.

In the first place, the eye is fairly discriminative of degree. These degrees answer to all distinguishable grades of brightness or luminosity from the self-luminous bodies which we are only just capable of looking at, down to the objects which reflect a minimum of light, and are known as black. This discrimination is very fine, as may be seen in our ability to note subtile differences of light and shade, and this delicacy is of the greatest importance in the visual discrimination of objects.

In sight, again, we have numerous and fine differences of quality. Of these the most important are color-differences. The impressions of color, like those of pitch, fall into a series of gradual changes. Passing from one extremity of the spectrum (or rainbow) scale to another, the eye experiences a series of perfectly gradual transitions. These changes fall into the series, violet, blue, green, yellow, orange, and red, together with certain finer distinctions, as indigo-blue, greenish blue. These differences of quality accompany (as in the case of pitch-sensations) changes in the rapidity of the vibrations of the stimulus, viz., the rays of light. The rays at the violet end have more rapid vibrations than those at the red end. These color-impressions, while an important element of artistic pleasure, are of great intellectual importance. The eye learns to know and to recognize things in part by means of their colors.

In addition to these differences of degree and quality in the sensations of sight, we have in this sense, as in that of touch, two endowments which furnish the basis of a perception of extension and space, including the form and magnitude of objects. The first of these is the discrimination of points by means of the distinct nerve-fibers, which terminate in a mosaic-like arrangement in the retina. Owing to this endowment, we can distinguish two points of light, say two stars, when they lie very near one another. This discrimination of points is finest in the central region of the retina, known as the area of perfect vision. It is by aid of this local discrimination that we are able in one glance to distinguish a number of details of form, such as the various parts of a flower or the several letters of a word.

Valuable as this retinal discrimination of points is in the perception of form, it needs to be supplemented by the muscular activity of the eye. The organ of sight is supplied with a system of muscles, by means of which it executes a large variety of delicate and precise movements. Sight is thus, like touch, an *active* sense. One result of this activity, as in the case of touch, is to bring the most sensitive part of the organ opposite the object we wish to examine. In fixing the eye on a point, we are obtaining a retinal image of it on the area of perfect vision. Another result is that, in the act of moving the eye from point to point of an object or of a scene, we bring the muscular sense into play, and thus gain a better impression of the relative position of the visible points, and of the form and magnitude of objects. It is by tracing the path of a line with the eye that we can best appreciate its perfect straightness, or the exact degree of its curvature. In early life more particularly this is the customary mode of acquiring knowledge of form.

Attention to Sense-Impressions.—For the production of clear sense-impressions it is not enough that the sense-organ be stimulated. There must be a reaction of the brain-centers and the co-operation of the mind in the act of attention. Till this reaction follows, the impression must, as pointed out in the preceding chapter, remain vague and indistinct. This direction of mental activity to an impression is the immediate condition of assimilating it as intellectual material. By fixing the mental glance on it, the intellectual functions are brought to bear on it, and so it is drawn into the store of our mental possessions, ready to be woven into the fabric of knowledge.

Discrimination of Sensation.—At any one time we may be acted upon by a multitude of external stimuli, sights, sounds, etc. These present themselves at first as a blurred or confused mass. The direction of attention to any one of them separates it from the adjacent crowd and gives distinctness to it. This fact may also be expressed by saying that it is "differenced" or discriminated. To have a clear and definite sensation is to distinguish it as something from the other sensations immediately preceding and accompanying it. As we have seen, this discrimination is much finer in the case of the higher senses —touch, hearing, and sight.

Identification of Sense-Impressions.—The direction of the attention to a sense-impression leads on not only to the discrimination of it. After the repetition of sensations of color, for example, a new sensation is at once identified, as one of yellow, green. This involves the persistence of traces of past similar sensations, and is a rudimentary form of that assimilation of new material to old on which all intellectual development depends.

Identification is exact in proportion to the fineness of the discrimination. If a child can only say a certain color is red, without being able to identify the precise shade of red, he shows that his discrimination of color is only partially developed.

Growth of Sense-Capacity.—From the above, it follows that there is an improvement of sense as life advances. Although the child has the same sense-organs and the same fundamental modes of sensibility as the man, his sensations are more crude, vague, and ill-defined. The repeated exercise of the senses in connection with and under the control of attention leads to the gradual differentiation of the several orders of sense-impression, and the rendering of them definite in their character. This growth of sense involves two things: (*a*) an increasing power of sense-discrimination, and (*b*) a growth in the power of identifying impressions through the cumulation of "traces." In other words, our senses become more delicate or *acute* in distinguishing impressions, and more quick or *keen* in identifying them.

Improvement of Sense-Discrimination.—Of these two aspects of sense-improvement, the discriminative is the more important, since it limits the other. The infant's sensations are at first confused one with another. The first distinctions (next to that of the pleasurable and painful) are those of degree or quantity. Thus, the visual impressions of light and darkness, of a bright and a dark surface, are distinguished before those of colors. As the senses are exercised, and attention brought to bear on their impressions, discrimination improves. With respect both to degree and to quality this improvement is gradual, beginning with the detection of broad and striking contrasts, and proceeding to that of finer differences. Thus, the contrast of loud and soft, of heavy and light, is arrived at long before nice differences of loudness or weight. Similarly, the contrast of the reds with the blues is arrived at before the finer differences between the several sorts of red.* In this way the senses become more acute with exercise.

Differences of Sense-Capacity.—Striking differences of sense-capacity present themselves among different individuals. These are of various kinds. Thus, A may be superior to B in respect of what is called *absolute* sensibility, or the quickness of response to stimulus. One child is much more readily impressed by a faint smell or sound than another. The tendency to respond to a very weak stimulus, coupled with good retentive or identifying power, would constitute a keen sense in the full meaning of the word, that is, one which readily notes and identifies impressions.

From these differences we must carefully separate inequalities in *discriminative* power. This is the important intellectual side of sense-capacity. It is found to characterize the more educated and intellectual classes. It does not vary with absolute sensibility. A may be more quickly responsive to a stimulus than B, and yet not be more discriminative.

These differences of discriminative capacity may be of a more general, or of a special kind. Thus, A may sur-

* The exact order in which the colors are distinguished is not certain, and probably varies somewhat in the case of different children. Prof. Preyer experimented with his little boy at the age of two, and found that he learned to identify colors on hearing their names in the following order: yellow, red, lilac, green, and blue. ("Die Seele des Kindes," p. 6, etc.; *cf.* Perez, "First Three Years of Childhood," p. 26, etc.)

pass B in his average sense-discrimination. Or he may surpass the other in some special mode of discriminative sensibility, as in the discrimination of colors or tones.

These inequalities are partly native and connected with differences in the organs engaged. Good average discriminative power probably implies from the first a fine organization of the brain as a whole and special concentrative ability, whereas a particularly fine sensibility to color, to tone, and so on, is connected rather with original structural excellence of the particular sense-organ concerned. It is this which fixes and limits the ultimate degree of delicacy reached. A child naturally dull in distinguishing notes or colors will never become finely discriminative in this particular region. At the same time, the remarkable superiority of certain individuals (and races) over others in respect of definite varieties of discriminative sensibility presupposes special concentration of mind and prolonged exercise of the discriminative function in this particular domain of impressions. This is strikingly illustrated in the exceptional delicacy attained by those who have occasion to employ a sense much more than other people. In this way we account for the fine tactile sensibility of the blind, the delicate gustatory sensibility of wine- or tea-tasters, and so on.

The Training of the Senses.—By the training or cultivation of the senses is meant the systematic exercising of the sense-organs (and of the attention in connection of these) so as to make them efficient instruments of observation and discovery. The first branch of this training is the developing by suitable exercises of the discriminative side of the senses. The special object of this branch is to render the senses quick and exact in seizing the precise shades of difference among the several impressions presented to them. And the importance of this exercise in sense-discrimination depends on the fact that, in proportion as we discriminate our sense-impressions finely, shall we be able to distinguish and know objects accurately, and, as a result of this, be afterward able to call up distinct images of them, and to think and reason about them. Indeed, distinct and sharply defined sense-impressions are the first condition of clear imagination and exact thinking. The child that confuses its impressions of color, form, etc., will as a consequence be only able to imagine and think in a hazy and confused manner.[10]

The exercise of the senses implies the direction of attention on the part of the child to what is present. It is thus, strictly speaking, the exercises of the *mind* under the stimulus of sense-impressions. Sense-knowledge is gained by the young mind coming into contact with things immediately, and not mediately by the intervention of another mind. Hence the function of the educator in this first stage of the growth of knowledge is a limited one. A good part of the exercise of the senses in early life goes on, and it is fortunate that it does so, with very little help from mother or nurse. The child's own activity, if he is healthy and robust, will urge him to use his eyes, his hands, and other organs in exploring things about him.

Nevertheless, a good deal may be done indirectly to help on this process of acquisition. The mother has the control of the child's surroundings, and may do much to hasten or retard the development of sense-knowledge by a wise attention to them or an indolent neglect of them. To supply children from the first with suitable materials for the exercise of their sense-organs, is the first and probably most important part of what is meant by training the senses, at least in very early life. Next to this comes the more direct co-operation of mother, nurse, or teacher in directing their attention to unnoticed sights and sounds, etc., in their surroundings.

Method of Training.—The training of the senses begins with the exercising the child in the discrimination and along with this in the identification of impressions. This may be carried out in a less systematic way in the nursery. The infant's surroundings, the toys to be handled, the pictures to be looked at, and even the tones of voice used in addressing it, should be chosen with a view to a sufficient variety of impression. The natural order of sense-development must be followed, the first differences brought under his notice being broad contrasts, as that of a hard and soft material, blue and yellow colors, high and low tones, and finer distinctions following. With variety should go a certain amount of repetition of impressions, so that the pupil be exercised in identifying impressions. Hence the surroundings should not be continually changed. A measure of sameness and permanence is necessary to thorough familiarity with the various sorts of sense-material.

A more systematic procedure can be gradually introduced, aiming at a full and accurate knowledge of the several sense-elements. Thus, in training the color-sense the educator may best proceed by selecting first of all a few bright and striking colors, as white, red, and blue. Each of these must be made familiar and its name learned. After being presented separately, they should be shown in juxtaposition, so that the differences may be clearly seen. This involves a rudimentary exercise of the faculty of comparison which in its higher form plays an important part in thought. Juxtaposition, or the bringing of two things side by side in space, or, as in the case of sounds, in immediate succession in time, is the most valuable instrument in exercising the senses. By seeing two colors side by side, the individual character of each is made more apparent, and the precise amount of difference appreciated.

When a few elements have thus been thoroughly learned, new ones may be added. In this way the child will not only add to its stock of sense-materials, but will have its former impressions rendered still more definite by a grasp of more numerous and finer differences. Thus, by adding yellow, orange, and so on, the learner will attain to more distinct ideas of what is meant by red.

It must not be forgotten that these finer exercises in sense-discrimination imply a severe effort of attention, and are apt to be felt as a strain at first, both to the sense-organ concerned, and to the brain. And it is of the highest importance not to push them to the point of fatigue. Thus in training the eye to a minute detection of differences of form in letters, etc., and the hand to the nice reproduction of these differences, there is special danger of overstimulating the organ and inducing fatigue, and, if persisted in, of causing injury to the organ.

If, however, the risk of over-exertion be avoided, it is possible, by proceeding judiciously, not only to keep these exercises from becoming wearisome, but even to make them positively agreeable. The main source of a pleasurable interest here is the child's love of activity, mental and bodily. The very employment of the sense-organs is a pleasure to the healthy and strong child. This pleasure will be the greater when muscular activity is also enlisted, and an appeal made to the little one's nascent feeling of power. Thus, in training the color-sense, after presenting unlike and like colors to the child's notice, he may be encouraged to select and sort the colors for himself. The active exercises of painting, drawing, and singing, in order to reproduce impressions of sight and sound, are the best means of training the corresponding senses.

Training of the Several Senses.—All the senses need exercise, but in different ways. The lower senses, being of but little value as knowledge-giving senses, claim less consideration from the intellectual educator. The cultivation and control of the palate have, however, an important bearing on physical education, on the disciplining of the body to healthy habits; and the due limitation of the pleasures of taste, the checking of that common childish vice, Näscherei, is one of the most valuable among the early exercises in the virtue of temperance. Again, the cultivation of the sense of smell, of sensibility to the odors of flower and herb, pasture and wood, summer and autumn, is an important ingredient in the formation of æsthetic taste, and more especially the development of that love of nature which is a prime factor in all real enjoyment of poetry.

From its great importance, touch claims special consideration in the education of the senses. The development of this sense is secured, to a large extent, by the child's own spontaneous promptings to handle and examine things. Still, the teacher may supplement this irregular self-instruction by special systematic exercises. The Kindergarten occupations, such as stick-laying, paper-folding, modeling in clay, etc., all serve to increase the discriminative sensibility of the organ of touch on its passive and on its active side. The teaching of the rudiments of drawing and writing completes this branch of sense-training. The perfect command of the hand in executing movements with a nice precision is the outcome of a fine muscular sensibility developed by special concentration of the attention, and by practice.[11]

The training of the ear is a well-acknowledged department of elementary education. In learning to articulate and to read, the child is called on first of all to distinguish a number of elementary sounds as well as to discriminate combinations of these. Along with this the muscular sense is exercised in so managing the organ of speech as to reproduce the precise sound required. Much the same holds good with respect to the systematic exercise of the ear in singing. Here, too, sounds have to be distinguished and identified. The first condition of singing accurately is to have a finely discriminative ear which will instantly detect the slightest degree of flatness or sharp-ness in the notes sung. And in conjunction with this, the vocal organ must be exercised so that the modifications answering to differences of pitch and force may be clearly distinguished and retained for future use.

The eye calls for the most careful and prolonged training, on account both of its intellectual and its æsthetic importance. A systematic training of the color-sense, somewhat after the plan roughly sketched above, is a desideratum both as an element of taste and as a matter of practical utility. And a careful discipline of the sense of form on its passive and active side is included in the recognized school exercises of reading, drawing, writing, etc. In truth, in this early stage of education the cultivation of the eyes goes on in close association with that of the hand. The whole fruit of this companionship will appear by-and-by. The separate exercise of the eye in the discrimination of form-elements is illustrated in learning to read printed letters as well as in the study of geometry.

Nowhere, perhaps, is the limit of the teacher's power more plainly seen than in the education of the senses. Since discriminative power depends on concentration of mind and practice, the child's ability to discriminate colors, tones, elements of form, etc., may be improved by judicious learning. Still, in every case a limit is sure to be reached in time, beyond which no further distinctions are possible. This limit, set by the structural perfection of the organ concerned, is a different one for different children. A child born note-deaf, for example, can never be drilled into a fine discriminator of tones. Hence the need of varying these exercises according to the capacity of the pupil and the results obtainable from the exercise.

APPENDIX.

A useful account of the senses, from a physiological point of view, is contained in Prof. Bernstein's "Five Senses of Man." [11a]

CHAPTER VIII.

THE SENSES: OBSERVATION OF THINGS.

Definition of Perception.—Sense-impressions are the alphabet by which we spell out the objects presented to us. In order to grasp or apprehend these objects, these letters must be put together after the manner of words. Thus, the apprehension of an apple by the eye involves the putting together of various sensations of sight, touch, and taste. This is the mind's own work, and is known as perception. And the result of this activity, i. e., the distinct apprehension of some object, is called a percept.

We see from this that perception is an *act* of the mind. In the reception of the sense-impression, the mind is passive, dependent on the action of an external force; but in construing this as the sign of some external object, it is essentially active. Perception is mental activity employed about sense-impressions with a view to knowledge. The first stage of this activity was discussed in the last chapter, under the head of *sense-discrimination*. This corresponds to the learning of the several letters. We have now to consider the second stage, that corresponding to the learning of words and their meanings. We have to explain how a child comes to regard its sense-impressions as signs of the presence of certain external objects, as, for example, certain sensations of sound as indications of a bell ringing, a dog barking, etc.

How Percepts are reached.—The seemingly simple act of referring a sense-impression to an external object is the result of a process of learning or acquisition. As little as a child at first knows the meaning of a word till experience has taught him, so little is he able to construe his sense-impressions as the signs of objects. In the first weeks of life a child can not recognize the external source of the sounds that strike on his ear. He has not learned to connect the sound of the mother's voice with the mother he sees; nor has he even learned to recognize the direction of a sound, as is clearly shown by the blank, wondering look of his face, and the absence of a proper movement of the head and eyes in the direction of the sound.

The apprehension of an object, say a bell, by the ear, involves two mental processes: The first is the discrimination and identification of the impression. In order to know that a particular impression of sound is that of a bell, it must be identified as this impression and not another, say that of a voice. This constitutes the first step in the process of perception. It may be marked off as the presentative or *prehensive* element. It presupposes previous experience of the impressions. Thus the child can not identify a particular sound as that of a bell till after a number of repetitions of this impression.

In the second place, the apprehension of the bell implies that this particular impression has been interpreted as coming from a particular object, viz., the bell. And this means that on hearing this sound the child recalls the appearance of the bell to sight and its tactile qualities, hardness, weight, etc. That is to say, the one actual sensation of the moment, that of the sound, has recalled and reinstated a whole group of impressions answering to the several features or qualities which constitute the object. This second step may be called the interpretative or *apprehensive* part of the process. And since the impressions recalled are not directly presented but only represented, this step is further known as the representative one. This act of construing or interpreting the impression presupposes that in the child's past experience the impression of sound has become connected with other impressions.

We see from this that the interpretation of sense-impressions presupposes previous processes of a complex kind, viz., discriminating a number of sensations of different senses, and grouping or organizing these into a coherent whole. There are thus two stages in the development of percepts: (1) the initial stage of examining things, by way of the different senses and learning to know them; and (2) the final stage of knowing again or recognizing a thing.

Special Channels of Perception.—The sensation of each sense tends to recall the other sensations of the group to which they belong, and so are capable of being interpreted by an act of perception. Thus, a child refers sensations of smell to objects, as when he says, "I smell apples," just as he refers sensations of light and color to objects, as when he says, "I see a candle." Nevertheless, when we talk of perceiving we generally refer to knowledge gained at the time through one of the higher senses, and more particularly sight. To perceive a thing means, in every-day parlance, to see it. Where sight is wanting, touch assumes the function of the leading perceptual sense; and even in the case of those who see, touch is an important medium of apprehending objects. Sight and touch are thus in a special manner channels of perception.

The reason why the senses of touch and sight are thus distinguished has been hinted at in the previous chapter. We there saw that they were marked off from the other senses by having local discrimination and an accompaniment of muscular sensation. Owing to these circumstances, these two senses supply us with a wider and more varied knowledge of objects than the other senses. In smelling a flower, or hearing the noise of a passing vehicle, I can only seize one aspect or quality of a thing; in looking at it I instantly take in a number of aspects, as its color, shape, and size.

The additional knowledge, gained by means of local discrimination and movement, is, moreover, of a most important kind. This includes first the knowledge of the position of things, and along with this a knowledge of their "geometrical" or space properties, viz., figure and magnitude. And, secondly, it includes a knowledge of their "mechanical" or force properties, viz., resistance under its several forms of hardness, weight, etc., as made known by active touch. And these properties are the most essential, forming the kernel, so to speak, of what we mean by a material object.

Touch and sight do not stand on precisely the same level as channels of perception. For, first of all, as we shall see presently, the knowledge of geometric properties is fuller and more direct in the case of touch than in that of sight. And, secondly, with respect to the important mechanical properties, hardness, weight, etc., our knowledge is altogether derived from touch. Hence, tactile apprehension is to be regarded as the primary and most fundamental form of perception.

Perceptions of Touch.—These may be roughly divided into (1) perceptions of space and extension, and more especially the position, form, and magnitude of objects; and (2) perceptions of things as concrete wholes, such as a pebble, an orange, etc.

The first kind of perception may be illustrated by the way in which a child learns the shape and size of a cube, say a small wooden brick. Here the sensibility of the skin to pressure, its local discrimination, and, lastly, the muscular sense, all combine in the development of the percept. The form of one of the surfaces is ascertained in different ways: (1) by moving the fingers over it in various directions and noting how long the contact with the body lasts; (2) by passing the fingers about the boundary of the surface and noting the uniformity of the direction of the movement along each edge, the length of the movement, and the change of direction at the angles; and (3) by placing the extended hand over the surface and noting, by means of the local discrimination of the skin, where the edges touch the hand. The knowledge of any one of its surfaces would thus involve the grouping of many sense-elements together, and the knowledge of the whole cubical form would further involve the grouping of a number of these groups together and the completion of this aggregate of experiences by taking the brick into the two hands. and so gaining a clearer idea of its solidity.

After repeating this complex act of tactile inspection again and again, the different members of the group would cohere so closely that the recurrence of a part would suffice to reinstate the whole. Thus the child, on merely taking the brick into his hands, would recall the successive experiences of movement just described. That, in this way, a child is able to gain very clear perceptions of form, is seen in the fact that the blind are capable of picturing and reasoning about geometrical forms with great clearness. And even in the case of children who have the use of their eyes, the earliest impressions of form are gained from tangible bodies, and to a large extent by the medium of active touch.

In apprehending the presence of a whole concrete thing, as a pebble, this group of impressions would be taken up into a still larger aggregate. Thus, in learning what a pebble is, a child connects what he has observed respecting its form with the hardness, coldness, smoothness, and weight. His knowledge of the pebble is the result of all this various sense-experience organized or united into a seemingly simple mental product. Where, as in the case of an apple or an orange, the other senses supply important elements (color, taste, and smell), the group of tactile impressions is ample for a subsequent identification of the object. The child, on touching an orange, instantly apprehends the thing as a whole, that is, recognizes it as an orange.

Visual Perception.—As remarked above, sight is in normal circumstances the leading avenue of perception. This supremacy is due in part to the fact that in looking we can apprehend things at a distance as well as near, and also a number of objects at the same time, as the pictures on the wall, the buildings of a street, etc. To this must be added the fact that when we see things we can tell how they would appear to touch. In other words, we translate visual impressions into terms of the earlier and more elementary experiences of active touch. Seeing is thus to a large extent a representative process and an interpretative act of the mind.

Perception of Form by the Eye.—In the perception of form the eye is up to a certain point independent of the hand. Thus, in learning the direction and length of lines, and the form and magnitude of objects as they might be drawn on a blackboard, the organ of sight is developing its own mode of perception. This visual perception, it is plain, resembles the tactile perception in so far as it arises out of a number of experiences, passive and active. Thus, in finding out, by looking at the gable of a house, what a triangle is, the child combines the experience gained in moving the eye about the contour, with the composite impression obtained by the local discrimination of the several parts by the retina. The precise direction and length of each line presuppose these movements of the eye along the outline of the object. It is only when these have been executed many times that the perception of form by the eye at rest becomes distinct. And this means that in looking at a figure the impression of the retina suffices to recall the experience of the moving eye.

The perception of any form, such as a cross, an ellipse, or the letter M, is the outcome of a process of combining a number of form-elements or details and clearly apprehending their relations one to another. Thus, in apprehending the form of the cross the learner must distinguish the vertical and horizontal arm, observing their directions as well as their relative lengths. The more exactly each element is discriminated, and the more clearly the relations of position, proportion, and number are seized, the more perfect the final percept.

This perception of form as plane form, or form as it can be represented on a flat surface, as a blackboard, is, however, fragmentary and abstract. The forms of real objects from which a child first gains his knowledge are those of solid bodies having the third dimension, thickness or depth as well as length and breadth. We see one part of the surface of a sphere nearer the eye or advancing, another part farther off or receding. This discrimination of a solid form as distinguished from a flat drawing involves the perception of distance.

Perception of Distance and Solidity.—The modern "Theory of Vision," of which Bishop Berkeley was the author, tells us that the perception of distance, though apparently as direct as that of color, is really indirect and acquired. In seeing an object at a certain distance, we are really interpreting visual impressions by a reference to movement of the limbs and to touch. We can only *realize* the distance of an object by traversing, either with the arm or with the whole body, the space that intervenes between us and it.

According to this doctrine, children do not at first see things as we see them, one nearer than another. This is proved by the experience of blind children on first obtaining the use of their eyes. All objects appear to such as touching the eyes. And they can not distinguish between a flat drawing and a solid body. It is only after using their eyes for some time that they learn to distinguish near and far. The development of the perception of distance takes place by the use of sight and touch together. A child finds out how far a thing is from himself by moving his limbs. Thus, an infant sitting up at a table finds out the distance of something on the table by stretching out its hands and noting how far it has to reach before it touches the thing. When it is able to run about, the movements of its legs become another measure of distance. In carrying out these movements the eyes are also employed. The child notes the difference to the eye when the object is near and when it is farther away. Thus, he observes that he has to make his eyes turn inward or converge more in the former case, and that the object looks more distinct. After many repetitions he learns to connect these experiences of active touch and these changing effects on the eye. When this process of grouping or organizing experiences is complete, the recurrence of the proper visual experience at once suggests the corresponding experience of movement and touch. Thus the sensation of muscular strain in looking at a near object instantly tells him that the object is near and within his reach. The visual sensation has become a sign of a fact known by the use of his limbs. Seeing distance is thus a kind of reading, and the meaning of the impression on the eye, like that of the letters in a book, has to be learned from experience.*

The perception of solid bodies illustrates the same thing. Here, too, the child has to interpret his visual impressions by the aid of past experience and the knowledge gained by active touch. That the eye has little knowledge of solidity is seen in the fact that even an adult may easily be deceived in taking flat drawings for solid objects (e. g., in the scenery of a theatre). The only way in which we can distinctly realize that an object has thickness is by taking it into the two hands.

* The perception of the *real* magnitude of an object, as distinguished from the *apparent* magnitude which varies with the distance, is closely connected with that of distance.

The apprehension of solidity by the eye is effected by means of certain signs. Thus, we can move the eye from a near to a more distant part of an object, and note the difference in muscular sensations of the eyes. Even when we do not move the eye, we have something to guide us in the dissimilarity of the two retinal impressions. In looking at a flat picture each eye receives a precisely similar impression; but in looking at a solid body their impressions differ. Thus, in looking at a book held a little in front of the face with its back toward us, our left eye sees more of the left cover, while the right eye sees more of the right. It is by noting this dissimilarity, and connecting it with the fact of solidity as known by active touch, that a child learns to recognize a solid object with the eyes.*

Intuition of Things.—In looking at an object, as in touching it, we apprehend simultaneously a group of qualities. These include first of all purely visual features, as its degree of brightness, the distribution of light and shade on its surface, its color (or distribution of colors), and the form and (apparent) magnitude of its surface. Along with these come the closely organized combinations of sight and touch, viz., the solid shape, and the nature of the surface as rough or smooth.† This may be called the fundamental part of our intuition of a particular object. In looking at a new object, as a crystal or a botanical specimen, we instantly intuit or take in this group of qualities, and they constitute a considerable amount of knowledge about the object as a whole. In order to know the thing as a whole, so as afterward to be able to recognize it with the eye, this aggregate must be conjoined with other qualities known by touch and by the other senses.

* The fact that the perception of solidity depends mainly on the presence of two unlike visual impressions is proved by the stereoscope, the two drawings of which, taken from different points of view, answer to the two retinal images of a solid body.

† This is made known to sight by differences of light and shade.

Thus, in recognizing an orange a child invests it more or less distinctly with a particular degree of hardness, weight, and temperature, as well as with a certain taste and smell.

The recognition of a thing as identical with something previously perceived is a complex psychical process. It involves not only the identification of a definite group of impressions, but also the germ of a higher intellectual process, namely, the comparison of successive impressions, and the detection of similarity amid diversity or change. Thus, a child learns to identify a particular object, as his mother, or his dog, at different distances and in different lights, and—a matter of still greater difficulty—according to the particular position and visible aspect of the object, as seen from the front or from the side, etc. Children require a certain amount of experience and practice before they recognize identity amid such varying aspects. And in this they are greatly aided by hearing others call the thing by the same name.

Perception of our own Body.—In close connection with the perception of external objects the child comes to know the several parts of his own body. The sensations which are not referred to external bodies are localized by us in some part of our organism. Thus, organic sensations, as skin-sensations of "creeping," muscular sensations of cramp or fatigue, are localized in some definite region of the body, the arm, or the foot. And the deep-seated feelings of comfort and discomfort connected with the organs of digestion, etc., are also localized in a less definite and vague manner. Such references are not possible at the beginning of life. A child has to learn where his bodily sensations are located ; and this he does by learning to know the several parts of his body.

The child's own body, like an external object, is known by means of the impressions it supplies to his senses, and more particularly touch and sight. An infant examines its legs, arms, etc., with its hands. By frequent excursions of these over the surface of the body, the position, shape, and size of the several parts become known. The eyes, too, are engaged in these early observations, so that a visual picture is gradually put together and combined with the tactile perception. As this knowledge of the bodily form is developed the several bodily sensations become better localized. Thus, in inspecting his feet with his hands the child is producing sensations of pressure in the former. In this way the sensations having their origin in that particular region of the bodily surface come to be definitely connected with that part as known to touch and sight. After this, whenever the child receives a sensation by way of the nerves running to that part, he knows at once that it is his foot that is giving him the sensation.

To a child his bodily organism is marked off from all other objects by the fact that it is connected in a peculiar way with his conscious life, and more particularly his feelings of pleasure and pain. The experience of pressing his foot with his hand differs from that of pressing a foreign body, inasmuch as there is not only a sensation in the hand, but an additional one in the foot. Injuries to the several parts of the bodily surface, and the application of agreeable stimuli, as soft touches, come to be recognized as causes of painful and pleasurable sensation. In these ways he comes to regard his body as that by which he suffers pain and pleasure. At the same time he learns that the movements of his body are immediately under the control of his wishes, that his limbs are the instruments by which he reacts on his environment, altering the position of objects, etc. Hence his body is regarded as a part of himself, and in early life probably makes up the chief part of the meaning of the word "self." It is contrasted with all other and foreign objects, and in a special way with the other human organisms he sees around him.

Observation.—All perception requires some degree of attention to what is present. But we are often able to discriminate and recognize an object by a momentary glance, which suffices to take in a few prominent marks. Similarly, we are able by a cursory glance to recognize a movement or action of an object. Such incomplete fugitive perception is ample for rough, every-day purposes. On the other hand, we sometimes need to throw a special degree of mental activity into perception, so as to note completely and accurately what is present. This is particularly the case with new and unfamiliar objects. Such a careful direction of the mind to objects is commonly spoken of as *observation.* To observe is to look at a thing closely, to take careful note of its several parts or details. In its higher form, known as *scientific observation*, it implies too a deliberate selection of an object or action for special consideration, a close concentration of the attention on it, and an orderly going to work with a view to obtain the most exact account of a phenomenon. Hence we may call observation regulated perception.

Distinct and Accurate Observation.—Good observation must be precise and free from taint of error. Many persons' observations are vague and wanting in fullness of detail and precision. The habit of close and accurate observation of things, their features and their movements, etc., is one of the rarest of possessions. It presupposes a strong interest in what is going on around us. This is illustrated in the fact that a child always observes closely and accurately when he is very deeply concerned, as, for example, in scrutinizing his mother's expression when he is not quite sure whether she is talking seriously to him or not.

Good observation presupposes two things: (1) the accurate noting of what is directly presented to the eye, or the perfect performance of the *prehensive* part of the process, and (2) a just interpretation of the visual impression, or the perfect performance of the second or *apprehensive* part of the operation. Defects in the first are very common. Children fail to note the exact form and size of objects, their situation relatively to other objects, etc. To see a number of objects in their real order, so as to be able to describe them accurately, is a matter of close, painstaking observation.

Any defect in the prehensive part of the process naturally leads on to faulty interpretation. Hasty and slovenly observation of color, form, or magnitude leads the young to false ideas of the objects they see, as when a child mistakes a lemon for an orange, two boys romping for two boys fighting. And even if the visual element is carefully noted, there will be an error of interpretation when the impression of the eye has not been firmly connected with the tactile and other experiences to which it is related as parts of one whole experience. Thus, if a child after seeing some simple experiments with metals fails to properly connect the several properties of malleability, fusibility, with the lead, iron, etc., the sight of a piece of one of the metals will be apt to reinstate the wrong properties. We thus see that accurate knowing or recognition depends on a careful learning or coming to know.

Defective and inaccurate observation is hindered by mental preoccupation. Dreamy and absent-minded children are, as a rule, bad observers. They only see things indistinctly as in a haze. Anything, too, in the shape of excitement and emotional agitation is inimical to careful observation, because it is apt to excite vivid expectations of what is going on, and so to lead to delusive perception. Thus, if a child strongly desires to go out, it is disposed to think that the rain has ceased when it is really still falling. Emotional children are very apt to read what they wish and vividly imagine into the objects before them.

We see, then, that while perception has its representative element, that while the child who distinguishes his visual impressions accurately but is unable to interpret them never attains to anything but useless scraps of knowledge, this representative factor has to be kept within due limits, and not allowed to hide from view what is actually before the eyes.

The highest kind of observation combines accuracy with quickness. In many departments of observation, as watching people's expressions and actions, or the scientific observation of a rapid process of physical movement or change, such as an astronomical and chemical investigation, rapidity is of the first consequence.

Development of Perceptual Power.—Our analysis of perception has suggested the way in which our percepts are gradually built up and perfected. In the first weeks of life there is little if any recognition of outer things. The child receives visual impressions, but these are not yet referred to external objects. It is by the daily renewed conjunctions of simple sense-experiences, and more particularly those of sight and of touch, that the little learner comes to refer its impressions to objects. By continually looking at the objects handled, the visual perception of direction becomes perfected, as also that of distance within certain limits. The child learns to put out his hand in the exact direction of an object, and to move it just far enough.* The perception of the distance and solidity of more remote objects remains very imperfect before locomotion is attained. The change of visible scene as the child is carried about the room impresses

* A child known to the present writer was first seen to stretch out his hand to an object when two and a half months old. The hand misses the exact point at first, passing beside it, but practice gives precision to the movement. The same child at six months knew when an object was within reach. If a biscuit or other object was held out of his reach, he made no movement, but as soon as it was brought within his reach he instantly put out his hand to take it. On the other hand, Prof. Preyer says his boy tried to seize the lamp in the ceiling of a railway compartment when fifty-eight weeks old. ("Die Seele des Kindes," p. 38.)

him, no doubt, but the meaning of these changes only becomes fully seized when he begins to walk, and to find out the amount of locomotive exertion answering to the different appearances of things. It is some years, however, before he begins to note the signs of distance in the case of remote objects. The same order shows itself with respect to the development of the perception of solidity. Thus a child learns in time to distinguish between the flat shadows of things on the walls and the pictures in his books, and real solid objects. But it is long before he learns that the distant hills and clouds are bulging, substantial forms.*

After many conjunctions of impressions children begin to find out the nature of objects as wholes, and the visible aspects which are their most important marks. That is to say, they begin to discriminate objects one from another by means of sight alone, and to recognize them as they reappear to the eye. Development follows here as elsewhere the line of interest. It is the objects of greatest interest, such as the bottle by which the infant is fed, that are first apprehended as real objects. After some months of tactile investigation the interpretation of visual impressions becomes more easy and automatic. Sight now grows self-sufficient. What may be roughly marked off as the touching age gives place to the seeing age. Henceforth the growth of perception is to a large extent an improvement of visual capability.

At first this power of discerning the forms of objects with the eye is very limited. A child will note one or two prominent and striking features of a thing but overlook the others. Thus, in looking at real animals or at his toy

* M. Perez ("First Three Years of Childhood," pp. 226, 227) remarks that a child of six months will take a flat disk with gradations of light and shade for a globe. He also remarks that children of fifteen months and more are liable to make absurd blunders as to the distance of remote objects, hills, the horizon, etc.

or picture imitations, he will distinguish a quadruped from a bird, but not one quadruped from another. Similarly, he will distinguish a very big dog from a small one, but not one dog from another of similar size.

The progress of perception grows with increase of visual discrimination; that is to say, of the capability of distinguishing one color, one direction of a line, and so on, from another. It presupposes, further, the growth of the power of attention which is the main ingredient in observation. As experience advances, children find it easier to note the characteristic aspects of things and to recognize them; and they take more pleasure in detecting their differences and similarities. In this way their observations tend gradually to improve in distinctness and accuracy. Not only so, an increased power of attention enables them to seize and embrace in a single view a number of details. In this way their first vague, "sketchy" percepts get filled out. Thus, a particular flower or animal is seen more completely in all its details of color and its relations of form. At the same time they acquire the power of apprehending larger and more complex objects, such as whole buildings, ships, etc.; and, further, assemblages of many objects, as the furniture in a room, or the plants in a garden, in their proper relative positions.

The observing powers may develop in different directions, according to special capabilities and special circumstances. The possession of a particular mode of discriminative sensibility in a high form, and a strong correlated interest in the particular class of impressions, will lead to a special consideration of things on that side. Thus the child with a fine eye for color will be specially observant of the color-side of objects. Again, the faculty of observation may grow in *rapidity* of action, and in *grasp* of a multitude of objects, according to the individual's special powers of attention. Once more, the development of a particular interest in a class of objects, as animals, flowers, faces, etc., will determine a special acuteness of observation in respect of these. Thus a boy with a marked love of horses becomes specially observant of their forms, actions, etc. So a boy with a strong leaning to mimicry and a keen, humorous interest in the expression of people's faces, etc., will be particularly observant in this direction. It may be added that particular enlargements of tactile and other experience will serve to give a particular depth and richness of suggestion to the individual's percepts. Thus a person who acquires special knowledge of the tangible properties of natural substances, woven fabrics, etc., will *see* more in these objects than another person.

Training of the Observing Powers.—This branch of intellectual training goes on in close connection with, and is at the same time the completion of, that training of the senses on their discriminative side which was considered in the last chapter. The first years of life are marked out by nature as the age for exercising the observing powers. The objects that surround the child are new and excite a vivid interest. He spontaneously spends much of his time in manipulating and scrutinizing things. The overflowing muscular activity of a healthy child is highly favorable to experimental investigation.

The beginnings of the education of the observing powers belong to the nursery, and consist in supplying the child with ample room to move about and a good stock of objects of interest for manual and visual inspection. Nothing is more fatal to this early development than checking muscular activity, forbidding children to touch and examine things.* By a free exertion of activity the child will learn for himself to organize his tactile and visual experiences so as to become proficient in interpret-

* As Miss Edgeworth observes, the best toys for the infant are things that can be grasped without danger, as ivory sticks, balls, etc., by help of which differences of size and form may be learned. ("Practical Education," i, pp. 7, 8.)

ing the visual signs of distance, solidity, etc. The addition of flat representations of solid objects in picture-books is a valuable supplement to this first domestic environment, since they help to fix the child's attention in a new way on the purely visible side of things, the difference and at the same time the similarity between the real solid thing and its pictorial representation. A more active direction of the observing faculty is required when the child grows and is capable of better fixing his attention on objects. This is the moment for calling his attention to less obtrusive objects at a distance, and so carrying forward the process of self-education to a more advanced point.[12]

Exercise in observing Form.—The transition from the nursery to the school should be marked by a more systematic training of the observing powers. This properly begins with exercising the child in the more accurate perception of form. The Kindergarten system has this as its chief aim. The principles which govern this early department of training are as follows: (1) The perception of form is grounded on the child's active experiences and the use of the hand. It is by the spontaneous outgoings of his muscular energy in examining objects and constructing them that all perception of real form arises. (2) The development of the perception of form should proceed from a conjoint tactile and visual, to an independent visual perception. (3) The observation of form should be exercised conformably to the general laws of mental development, viz., passing from the rude and indefinite to the exact and definite, from the concrete to the abstract, and from the simple to the complex. The Kindergarten gifts and occupations clearly satisfy these conditions in general. Froebel was psychologically right in utilizing the child's spontaneous activity, in setting out with tangible objects, as the ball, etc., and in attaching so much importance to the exercise of the child's constructive activity in the reproduction of form by the occupations of modeling, stick-laying, paper-folding, etc. All such exercises involve a recreation of form by actions of the hand similar to those by which the infant spontaneously investigates the form of things. Hence they are to be regarded as the natural completion of the earlier training of the nursery.

Such exercises do not, however, constitute all that is meant by training the child in the perception of form. From an early period he is interesting himself in the forms of natural objects, as animals, trees, flowers, etc., as well as buildings, articles of furniture, etc. And he should be exercised in a more close and exact observation of these forms. The child naturally observes at first only the more salient features of an object, such as the tallness of the poplar, the long neck of the swan, which may afterward serve as a rough mark for identifying the object. How little he really notes may be seen by his first rude attempts at drawing the human figure, the horse, etc. The development of the perception of form proceeds analytically, the rough outline being first apprehended, and then the several details. The educator should follow this order, and practice the observer in attention to the minuter details of form. In this way the child will grow more discriminative in his perceptions of form and learn more about the minute parts of common and familiar objects.

Here, again, the hand should be called in, in order to reproduce what is seen. The child's spontaneous impulse to imitate nature by drawing is one of the most valuable ones to the educator. Compared with modeling, drawing is to a certain extent abstract, since it separates the visible form from the tangible. Accordingly it is best taken up after modeling, building, etc. At the same time the child commonly manifests the impulse to draw at an early age, and the satisfaction of the impulse provides an excellent means of gaining a closer acquaintance with visible form.

Not only so, by employing the hand in the production or creation of form by definite manual movements, drawing supplies a valuable additional means of training the eye and the hand in unison, and so of perfecting the connections between touch and sight. A child who has become skillful in drawing has not only acquired a useful manual art, but has helped to develop his power of *seeing*, i. e., of deciphering the symbols that present themselves to his eye. In these exercises the teacher should be satisfied at first with rough and approximate imitations of natural forms, and aim at making these more close and accurate by practice.*

A more advanced stage in the visual perception of form is reached when the learner takes up the abstract consideration of form by a study of the elements of geometry. A knowledge of lines, curves, angles, etc., should distinctly follow a certain amount of exercise in the observation and reproduction of concrete forms. To distinguish a straight line or a right angle is a dry and uninteresting exercise compared with noting the form of some real object, and involves a certain development of the power of abstraction. Such exercises should be commenced by references to concrete forms, as the window-frame, the edge of the house, its gable, etc. In this way the child will gain an interest in the subject, and at the same time further develop his perceptions of concrete forms by a clearer recognition of their constituent parts.

The Object-Lesson.—After the exercise of the child in the perception of form comes the training of the senses as a whole in the knowledge of objects and their constituent qualities. The systematic development of this side of the training of the senses gives us the object-lesson. By this is meant the presentment to the pupil's senses of some natural substance, as coal, chalk, or lead ;

* On the best way to exercise the child in drawing, see Mr. Spencer's "Education," chap. ii, p. 79, and following.

some organic structure, as a plant or animal; or, finally, some product of human industry, as glass or a piece of furniture; and such a detailed and orderly unfolding of its several qualities, its capabilities of being acted on by, and of acting on, other things, its relations of dependence on surroundings, etc., as will result in the fullest and clearest knowledge of the object as a whole and its conditions. It is evident, from this general description, that the object-lesson makes a special appeal to the several senses, and, while thus exercising the senses separately, helps to train the learner in the connecting and organizing of a number of impressions. Thus, in an object-lesson on one of the metals there is an appeal made to the sense of touch (sensations of hardness, smoothness, etc.), and in one on salt, an appeal to the sense of taste. The object-lesson thus falls into two parts: (1) the detailed exposition and naming of the various qualities, and (2) the summing up of the results in a description of the whole thing. The object-lesson is a training in close observation of objects; and, since the first stage of science is observation, including experiment, this form of instruction constitutes a fit introduction to the study of physical science. Its value depends, first of all, on the extent to which the observing powers of the class have been made use of. The teacher must not tell the pupils what the object is, but stimulate them to observe for themselves. Again, it depends on the clearness and precision with which the several properties have been unfolded, so that a complete and accurate idea of the whole may be attained. Once more, it involves the proper use of juxtaposition, so as to exercise the observer's power of comparison and discrimination. And, lastly, it implies that the result of each separate observation has been carefully recorded by a suitable name. The object-lesson, properly carried out, is one of the best methods of developing in children a habit of observation and a taste for scientific experiment.

The object-lesson aims at nothing beyond the training of the observing powers themselves. Its purpose is realized when the object has been accurately inspected and its properties learned. Hence it must be marked off from all appeals to the senses which subserve the better imagination and understanding of a subject dealt with mainly by verbal instruction, such as the use of models and maps in teaching geography; coins, pictures, etc., in teaching history; and such an apparatus as Mr. Sonnenschein's in teaching the elements of number. All these exercises call in the aid of the senses according to the general principle of modern education, that knowledge begins with the apprehension of concrete things by the senses of the child.

While the calling in of the pupil's observing powers is thus a characteristic of the right method in all branches of teaching, there are some subjects which exercise the faculty of observation in a more special manner. Thus, the study of geometry and of languages help, each in its own special and restricted way, to exercise the visual observation of form. But the study which most completely and most rigorously exercises the faculty of observation is natural science. A serious pursuit of chemistry, mineralogy, botany, or some branch of zoölogy, as entomology, trains the whole visual capacity, and helps to fix a habit of observing natural objects, which is one of the most valuable rewards that any system of education can bestow.

It is not to be forgotten, however, that the best training of the observing powers lies outside the range of school exercises. A habit of close observation of nature is best acquired in friendly association with, and under the guidance of, an observant parent or tutor, in hours of leisure. A daily walk with a good observer will do more to develop the faculty than the most elaborate school exercises. The training of the observing powers is indeed that part of intellectual education that most requires the aid of other educators than the schoolmaster. And one evil resulting from our modern aggregation into big towns, and our growing school demands on the time and energies of children, is that so little opportunity and energy remain for those spontaneous beginnings in the observation of nature, the forms of hill and dale, the movements of stream, waves, etc., the forms and movements of plants and animals, which are the best exercise of the observing faculty; and for those simpler and more attractive kinds of scientific observation, e. g., collecting birds' eggs, fossils, etc., which grow naturally out of children's play-activity.

APPENDIX.

The development of visual perception is clearly described by M. Taine, "On Intelligence," part ii, book ii, chap. ii, sect. iv–vi. The child's first perceptions of direction, distance, etc., are recorded by Prof. Preyer, *op. cit.*

On the training of the observing powers, the reader will do well to consult Mr. Spencer's "Essay on Education," chap. ii, and Miss Youmans's little work on the "Culture of the Observing Powers of Children." The function of the nursery in drawing out the observing faculty is well illustrated by Miss Edgeworth, "Practical Education," chap. i, "Toys." The difficult subject of the object-lesson is dealt with in a suggestive way by Dr. Bain, "Education as a Science," chap. viii, p. 247, etc.; and by Mr. Calkins, "New Primary Object-Lessons" (Harper & Brothers), p. 359, etc. The defects of natural observation and the educational improvement of the faculty are ably treated by Mr. Thring, "Theory and Practice of Teaching," part i; see especially chap. vii. The German reader may with advantage read Waitz, "Allgemeine Pædagogik," part ii, section 1, "Die Bildung der Anschauung."

CHAPTER IX.

MENTAL REPRODUCTION.—MEMORY.

Retention and Reproduction.—The senses are the source of all our knowledge about external things. But, if we were only capable of observing objects, we could gain no lasting knowledge about anything. Knowledge of things is not a momentary attainment, vanishing again with the departure of the things; it is our enduring possession, which we can make use of at any time, whether the objects are before us or not.

This persistence of the impressions which objects make on our minds through the senses is due to that important property of the mind called retentiveness. This property, as was pointed out in an earlier chapter, is connected with the physiological fact that the brain centers are permanently modified by their various modes of activity. Thus the activity of the visual centers involved in seeing and observing a flower or a person's face leaves as its after-result a lasting trace of this activity, by the help of which we can afterward recall the impression of the object and think about it. This independent activity of the brain is seen in a striking form in the case of one who, like Milton, has lost his sight, yet can distinctly recall the objects he has seen in the past.

Retentiveness shows itself in the ability to reproduce the impression when occasion presents itself. Thus the mind retains the impression of a person's face, of a tune, and so forth, when it can afterward revive or recall this. We know nothing about retention except through the fact of mental revival or mental reproduction. It is true that the mind can not always recall what it has retained. A child is sometimes tenacious in retention, and at the same time slow and awkward in recalling what he knows. On the other hand, it is evident that what we can not reproduce at any time is not retained. The teacher necessarily judges what a child has retained of a lesson by the amount he can reproduce under favorable conditions.

Reproduction and Representation.— Whenever the mind thus recalls what is no longer present to the senses the process is called representation, i. e., the act in which the mind *re*-presents to itself what was before presented. Thus, in recalling our absent home or friend, we see with the mind's eye the object we actually saw when it was present. This process is also called reproductive imagination, because in thus mentally realizing an object in its absence, we are really exercising a form of imagination. The result of the operation is known as a mental image. The image is the copy of the percept. We picture the house as it actually presented itself to our eyes, with its proper shape, color, etc. Only, as a rule, our images are much less complete and distinct than our percepts. In recalling a friend's face, we do not ordinarily represent all its features as they would actually appear when the person was before our eyes.

As was pointed out in the last chapter, there is an element of representation in perception. In seeing a globe, for example, we are reproducing tactile experiences. Further, in recognizing a familiar object, as our house or a friend's figure, we are plainly recalling past percepts of this object. This, however, is a lower form of reproduction than that which takes place when the object is no longer present; for in this case there is no presentative element, and the representation is more complete and independent. It is this independent activity of the mind that we specially think of when we talk of representing or picturing objects.

While we naturally think first of mental pictures, i. e., copies of visual percepts, when we talk of images, we must be careful to include under the term copies of percepts and sense-impressions generally. Thus we must say that the mind imagines or forms images of sounds, as words, etc., as well as tactile percepts, odors, and tastes. The most important images are copies of visual and auditory percepts.

This mental region of pure representation roughly answers to what we commonly call memory. To remember a thing is to retain an impression of it, so as to be able to represent or picture it. Everything that we learn has thus to be taken possession of by the mind. The knowledge that the child gains, whether by the direct examination of objects or by way of words, is acquired for the express purpose of retaining and recalling. Even the higher and more abstract kind of knowledge has to be stored up in the mind for subsequent reproduction. Hence the laws of reproduction are of special interest to the educator. He has to do with the process of learning, or acquisition, of which reproduction is the chief ingredient. To understand how to control and direct these processes, with a view to the maximum result in the shape of clear and abiding knowledge, is one of the chief objects of a study of mental science.

Conditions of Reproduction.—The most general condition of reproduction is a certain degree of recency of the original impression. We readily recall any object or incident of the immediate past, such as the appearance and voice of the person we have just been speaking with. Older impressions are, as a rule, less easily recalled. The longer the interval between the presentation and the representation, the less distinct and prompt will be the latter. The lines the child can repeat a few minutes after going over them will tend to disappear after an hour or a day or two. It is thus apparent that the after-impressions left by what we see, hear, etc., tend to grow less and less vivid and distinct as time elapses. The scenes, personages, and experiences of our remote past are for the greater part lost to us.

Coming now to more special conditions, we may say that the capability of representing an object or event some time after it has been perceived depends on two chief circumstances. In the first place, the impression must be stamped on the mind with a certain degree of force. This circumstance may be called the depth of the impression. In the second place, there is needed in ordinary cases the presence of something to remind us of the object or to suggest it to our minds. This second circumstance is known as the force of association.

(A) Depth of Impression: Attention and Retention.—In the first place then (assuming that there has been only one impression) we may say that a distinct image presupposes a certain degree of perfection in the impression. A bright object distinctly seen is recalled better than a dull one obscurely seen. The chalk diagram on the blackboard stands a better chance of being recalled than a less forcible impression. For this reason actual impressions are in general much better recalled than products of imagination. A child will generally recall the appearance of a place he has actually seen better than one that he has heard described. The habit of repeating words audibly when we want to remember them is based on this principle.

Again, the permanence of an impression is determined not merely by its external character, but by the attitude of the mind in relation to it. If our minds are preoccupied, even a powerful impression may fail to produce a lasting effect. Hence we have to add that the permanence of an impression depends on the degree of interest excited by the object, and the corresponding vigor of the act of attention. All strong feeling gives a special persistence to impressions, by arousing an exceptional degree of interest. Where a boy is deeply affected by pleasurable feeling, as in listening to an attractive story or in watching a cricket match, he remembers distinctly. Such intensity of feeling, by securing a strong interest and a close attention, insures a vivid impression and a clear discrimination of the object, both in its several parts or details, and as a whole. And the fineness of the discriminative process is one of the most important determining conditions of retention.

The interest determining the force of attention may, as we have seen, arise directly out of some aspect of the object, as its novelty, beauty, its suggestiveness, and so on. A pleasurable feeling, flowing from the perception itself, is the best guarantee of close attention and fine discrimination. The events of our past life which are permanently retained commonly show an accompaniment of strong feeling (wonder, delight, awe, and so forth).[13] Where this powerful intrinsic interest is wanting, a vigorous effort of voluntary attention may do something to bring about a permanent retention.

Finally, it is to be observed that our minds are not always in an equally favorable state for the retention of impressions. Much will depend on the degree of mental vigor and brain vigor at the time. A fresh condition of the brain, such as is realized after a period of repose, is necessary to a deep and lasting after-trace of retention of impressions.*

Repetition and Retention.—We have just assumed that the object or event recalled has been perceived but

* Prof. Bain considers that acquisition or storing up new impressions is of all forms of intellectual activity that which involves the largest consumption of brain-force.

once only. But a single occurrence of an impression rarely suffices for a lasting retention. Since every impression tends to lose its effect after a time, our images require to be re-invigorated by new presentations of the object. Most of the events of life are forgotten just because they never recur in precisely the same form. The bulk of our mental imagery, the natural scenery, buildings, persons, etc., that form our surroundings, answer to objects which we see again and again. Here, then, we have a second circumstance determining the depth of an impression. The greater the number of the repetitions, the more enduring will be the image. Where the repetition of the actual impression is impossible, the repeated reproduction of it serves less effectually to bring about the same result. By repeating to ourselves internally a person's name again and again soon after hearing it, we help to fix it in the memory.

The repetitions must not only be numerous but frequent. In learning a new language we may look up in a dictionary an uncommon or rarely occurring word a good number of times and yet never gain a firm hold on it, just because the repetitions are not frequent enough; whereas, if the word is a common one, and occurs frequently, the same number of references to the dictionary will more than suffice. The reason of this is that the after-impressions tend to fade away after a little time, so that each effect must be followed up by another soon enough. The process may be likened to that of damming a stream with stones. If we throw in the stones with sufficient rapidity, we may succeed in fixing a barrier. But if we throw in one to-day, and another to-morrow, the effect of the first throw will be obliterated by the force of the stream before the reinforcing effect of the second is added.

These two conditions, interest and repetition, take the place of one another to a certain extent. The more interesting an impression, the fewer the repetitions necessary to fix it in the mind. This is illustrated in the words of Juliet:

> "My ears have not yet drunk a hundred words
> Of that tongue's utterance, yet I know the sound."

On the other hand, the more frequently an impression recurs, the less interesting does it need to be in order to find a lodgment in our minds. As has been humorously observed, even matters of such little interest to us as the fact that Mr. G. sells Eureka shirts stamp themselves on our memory after they have been repeatedly forced on our attention by a sufficient profusion of advertisements. Nevertheless, in ordinary cases both conditions must be present in considerable force. This certainly applies to the larger part of school acquisitions. Interest is rarely so keen here as to be able to dispense with a number of repetitions. On the other hand, no number of repetitions of a lesson will avail if there is no interest taken in the subject, and the thoughts wander.

(B) Association of Impression.—When an impression has been well fixed in the mind there remains a predisposition or tendency to reproduce it under the form of an image. The degree of facility with which we recall any object always depends in part on the strength of this predisposition. Nevertheless, this predisposition will not in ordinary cases suffice in itself to effect a restoration after a certain time has elapsed. There is needed further something present to the mind to *suggest* the image, or remind us of the event or object. Thus the sight of a place reminds us of an event which happened there, the hearing of a person's name of that person, and so on. Such a reminder constitutes the "exciting" as distinguished from the "predisposing" cause. The reason why so many incidents of our past life, including our deeply interesting dream-experiences, appear to be wholly forgotten is that there is nothing in our present surroundings that distinctly reminds us of them.

Whenever we are thus reminded of an impression by some other impression (or image), it is because this is somehow connected in our minds or "associated" with the first. Thus the event is associated with the place which recalls it, and the person with his name. Hence we speak of association as the second great condition of reproduction.

Different Kinds of Association.—One impression may be associated with another in different ways. Let A stand for the antecedent or reminder, B for the consequent or the representation called up. Then A and B may correspond to two objects locally connected, as two adjacent buildings, or to two events following one another in time, as sunset and the coming on of darkness. Or, again, they may stand for two like objects, as a portrait and the original. These various kinds of connection are reduced by the psychologist to the smallest number of principles or laws of association. They are commonly brought under three heads, viz., contiguity, similarity, and contrast.

(I) Association by Contiguity.—Of these kinds of association the most important is that known as contiguous association, or association by contiguity. By this is meant the association of two or more impressions through, or on the ground of, their connection in time. Its law may be stated briefly as follows: Presentations, impressions, or experiences which occur together, or in immediate succession, will afterward tend to revive or suggest one another.

This principle is illustrated throughout the whole process of learning, both from the actual inspection of things, and by way of others' instruction. Whenever the mind connects two or more impressions, facts, objects, or experiences, because they have occurred or presented themselves together, this is an illustration of the law of contiguity. Thus, in coupling an action with the person who performs it, or a thing with its name, or an event with the place where it occurred, we are illustrating this principle.

The more important varieties of contiguous association may be brought under the following heads: (1) First of all, we have impressions, actions, or events, which occur together or in immediate succession, as the sight of a bell swinging and its sound, the shining of the sun and the feeling of warmth, one bit of a tune and the following bit. Among the successions of actions and events the most important are those of cause and effect. The child comes to know that the sun warms, that rain wets, that hard bodies hurt, that his own actions produce certain results, e. g., the removal of obstacles by noting how one thing follows another, i. e., by connecting things according to the law of contiguity. (2) Next may be mentioned associations with objects including persons. Thus the child connects the various properties and powers it discovers in things, such as the divisibility and the combustibility of wood with this substance, the voice, gestures, etc., of persons with these; also the uses to which things may be put and the gratifications to be obtained from them with the objects themselves, such as the ball's capability of being rolled, the capability of the toy-bricks to support others, and so forth. (3) Our next group consists of local associations, which play a conspicuous part in memory. These include (*a*) connections of objects with places, as the cowslips with the fields, books, toys, etc., with the places where they are put away and kept; (*b*) events and places, as the meal, the lesson, the punishment, and so on, with the room in which they take place; and (*c*) places with other and contiguous places, and features of the environment with others which are contiguous in place, as the sea and the sandy shore, the river and the bridge across it, one house or street and the adjacent one.

All learning by instruction, too, illustrates the same law. In learning about distant places and about the past history of his country, the child has to build up association of time and place like those he builds up in the course of his daily observations of the things around him. More than this, learning proceeds very largely by aid of verbal associations, and more particularly associations of things with words, and one word with another. In learning the names of objects, places, persons, etc., the child is linking together impressions that occur at the same time. Thus he learns the name of a person by hearing the sound while the person is present. On the other hand, committing anything to memory by stringing on a series of words illustrates the association of consecutive impressions. One word of a verse has to be connected with the following, and so on.

Strength of Associative Cohesion.—The law of contiguity speaks of a *tendency* to call up or suggest. This means that the suggestion does not always take place, that the antecedent is not always followed by the consequent, and that, in some cases, the sequence is much more prompt than in others. We may easily see by observation that this is so. Thus we sometimes hear names of persons and places without representing the corresponding objects; in other words, the names do not call up the appropriate images. In other cases, again, the revival is certain and rapid, as when a familiar word in the native tongue, as "home," "father," calls up the idea which it symbolizes. Indeed, in a certain class of cases, the revival is so rapid that the mind is hardly aware of a transition from antecedent to consequent. Such are the suggestions of a vocal action by the connected sound (articulate or musical), of a manual movement by a visible sign, and of a feeling, say of anger, by the visible expression. We express this fact by saying that there are different degrees of cohesion among our impressions, and consequently different degrees of suggestive force.

On what Suggestive Force depends.—The suggestive force in any case depends on the same two circumstances as we found governing the persistence of impressions regarded as single or apart. These are first the amount of attention given to the impressions when they present themselves together ; and secondly, the frequency of their concurrence.

Two impressions may become closely associated with one another by a special act of connective attention at the time. Thus, when a child is greatly interested in a stranger, and pays particular attention to his name at the same time, he in a manner makes one object of them, so that the recurrence of the one suggests the other. In learning a lesson in geography the child has to firmly conjoin things, e. g., a town with the country in which it lies, the river on which it stands, etc. The greater the force of attention directed to two objects, and the more closely the mind grasps them by one act of attention, the stronger will be the resulting association. This presupposes a development of the power of attention in grasping a plurality of objects in their relations of time, place, etc. It is to be added that this work of conjoining impressions is only possible when the mind is free from preoccupation, and the brain is in a fresh and active condition.

It is, however, but rarely that a single conjunction of two experiences effects a permanent association. Repetition of the original experiences is necessary in the great majority of instances. All our enduring knowledge about the things around us, the varying phases of earth and sky, the locality we live in, the persons we are familiar with, involves repetitions of impressions together or in company with one another. The child's association of sunlight and warmth, of a street with the interesting shops in it, of a person with his acts of kindness, is the result of many impressions. The more frequent the conjunction of the impressions, the stronger the resulting bond of association between them. The closest associations, such as those between vocal actions and the resulting sounds, words, and the things named, the movements of expression, and the feelings expressed, are the result of innumerable conjunctions extending throughout life.[14]

Trains of Images.—All that has been said respecting pairs of impressions and the resulting representations applies also to a whole series. A good part of our knowledge consists of trains of images answering to recurring and oft-repeated series of sense-impressions. Thus our knowledge of a street, and of a whole town, consists of a recoverable train of visual images. In like manner, we are able to recall a series of visible movements or actions, as those of a dance, and a succession of sounds, as those of a tune. Our knowledge of every kind is closely connected with language, and is retained to a considerable extent by help of series of words. Again, our practical knowledge, our knowledge how to perform actions of various kinds, such as dressing and undressing, speaking and writing, is made up of chains of representations.

All such chains illustrate the effects of attention and of repetition. The more closely a child has attended to the order of a series of notes or words, events in a story, and so forth, the better will the several links of the chain be connected. And the more frequently the series has been gone over, the easier will it be for the mind afterward to reproduce it. In cases where the repetitions have been very numerous, the mind is able to retrace the succession with perfect ease and in a semi-conscious way, as in going over the alphabet, the numerals, etc.

At first these trains of representations are not self-supporting. They are bound up with, and dependent on, actual presentations. Thus a child learning a tune is able at first only to recall the successive notes step by step as he hears the tune sung (or plays it himself). That is to say, revival is still dependent on the stronger suggestive force of actual impressions. Gradually the series of images becomes independent of the exciting force of impressions. Thus, when the tune is perfectly learned, the child's mind can run over the whole without any aid from the ear.

Verbal Associations.—Among the most important of our associations are those of words. Language, being the medium by which we convey our impressions and express our thoughts one to another, plays a conspicuous part as a suggestive force. We habitually recall our impressions by the aid of verbal signs. This is especially true of all the knowledge we gain from others, or learn by instruction and reading. Such knowledge, more particularly the more abstract kinds, is embodied in, and reproduced by, words.

Every word is in itself the result of joining together a number of elements. The first step in learning to speak is the linking on of a definite variety of vocal action to its proper sound. Later on, when the child learns to read, he combines with this associated couple the visual symbol, viz., the printed word. Finally, in learning to write, the child builds up new associations between definite groups of finger-movements and the corresponding visual symbols.

Again, in learning language, there are not only these associations between the different constituents of the word, but also the connecting of the word as a whole with its proper idea. Learning to speak, to read, and to write, plainly includes this further connection between the word symbol and its meaning.

These verbal groups are capable of becoming associated in definite series, and it is by the aid of such series that our knowledge of things in their order of time and place is retained. This applies to what the child himself observes, for he loves to describe what he has seen to others, and in so doing he makes his knowledge more lasting by embodying it in series of words. And it applies still more to all the knowledge gained by others' instruction. Here the facts are presented to him by the medium of language, which thus naturally comes to be taken up into the whole mental impression retained.*

(II) Association by Similarity.— Although the principle of contiguity covers most of the facts of memory, it is usual to lay down other principles of association as well. Of these the most important is association through similarity. This principle asserts that an impression (or image) will tend to call up an image of any object previously perceived which resembles it. Thus the face or voice of a stranger suggests by resemblance another and familiar one ; a word in a foreign language, a word in our own, and so forth. The more conspicuous the point of resemblance between two things, and the greater the amount of their resemblance compared with that of their difference, the greater the suggestive force.

This kind of association is plainly marked off from the first. Contiguity associates objects, events, words, etc., which present themselves together, or at (or about) the same time in our experience. Similarity, on the other hand, brings together impressions, objects, and events widely remote in time. Thus a face or a bit of landscape seen to-day may remind us of another seen years ago in a distant part of the globe.

The acquisition of knowledge is greatly aided by this "attraction of similars," as it has been called. If everything we had to learn, whether by actual observation or by books, were absolutely new, the burden would be insupportable. When a boy or a girl studies a new language, for example, the similarities very greatly shorten the labor. Thus, when the German word Vogel calls up the familiar

* It is not meant that all the elements of the word are equally distinct in all cases. When a child learns something by oral instruction he will recall the sounds ; when he learns from a book, he will rather recall the visible words.

name fowl, its meaning is at once fixed. The new acquisition is permanently attached to the pre-existing stock of acquisitions through a link of similarity. Or, as we commonly express it, the new is assimilated to the old. It may be added that every discovery of similarity in the midst of diversity is attended by a feeling of pleasurable excitement or elation; and this acts as a powerful force in binding together the similar things in the memory.[15]

(III) Association by Contrast.—In addition to the principle of similarity, another principle of association known as contrast is frequently laid down. By this is meant that one impression, object, or event, tends to call up the image of its opposite or contrast. Thus it is said that black suggests white; poverty, wealth; a flat country, a mountainous, and so forth.

The part played by contrast in memory is due to the fact that all knowledge begins with marking off one thing or one property of a thing from other and different ones. The first step in acquiring knowledge is to discriminate. The child first discriminates impressions and objects of the same kind which are widely unlike, or opposed to one another, as light and dark, sweet and sour, a big and a little dog, etc. This would tend to build up in the child's mind a number of associations between contrasting things. It may be added that all strong dissimilarity is in itself impressive, and tends to stamp itself on the mind. Children are struck by contrast as they are by likeness. Thus the sight of a tall and a short person walking together, or of something very unusual, as a dwarf, is certain to arrest their attention, and so to further the retention of a vivid after-impression of the objects in association. In learning, this principle may be made use of. Thus, a strongly marked contrast in two contiguous countries, or two consecutive reigns in English history, helps to fix the association in the learner's mind.*

* Mr. Fitch gives a good example of the effect of contrast or unex-

Complex Associations.—So far it has been assumed that association is simple, that each element of knowledge only enters into a single associative combination. But this does not correspond with the facts. Association is highly complex. One element may enter as a member into a number of distinct combinations. Thus the image of the Colosseum at Rome is associated with that of events in my personal history, of pleasant days passed at Rome, of historical events, such as the gladiatorial combats of the Empire, its conquests and luxury, etc. The threads of association are not distinct and parallel, like the strings of a harp, but intersect one another, forming an intricate network.

Co-operation of Associations.—One result of this complexity is that different threads of association converge in the same point; so that the recalling of a fact may take place by the co-operation of a number of suggesting forces. The general effect of such co-operation may be stated in the principle that the more numerous the associations between a particular impression and other mental elements, and the more firmly it is associated with each, the more likely is it to be recalled.

In recalling a series of words, for example, as those of a poem, the child's mind may travel along any one of a number of parallel paths. Thus it may move now along that of the sounds, now along that of the visual signs, and now along the series of images or ideas corresponding to the objects described and events narrated. And thus, if the members of one series are not firmly knit together, his mind can make use of the other series. Thus, in forgetting how the sounds follow one another, it may take advantage of the visual series, the images of the printed words.

To take another and somewhat different kind of ex-

pectedness in imprinting a fact on the memory, viz., learning for the first time that "Rule Britannia" was written by Thompson, the singer of quiet pastorals. "Lectures on Teaching," p. 130.

ample : the date of an historical event is associated with that of simultaneous events at home or abroad, and of preceding and succeeding events. And so a child may recall it by way of any one of these channels. These combinations include associations by similarity as well as by contiguity. A person's name may be recalled not only by recalling his appearance, the book of which he is the author, and so on, but also by way of some other name which it resembles. Thus the succession of Saxon kings is aided by the similarity of their names. In like manner the learning of the verses of a poem is aided by the similarities of meter and rhyme.

Obstructive Associations.—While looked at from one point of view the fact of the complexity of association is an aid to memory, looked at from another it is an obstruction. If an impression or fact is associated with a number of other impressions, disconnected one with another, then the mind in setting out from this image is liable to be borne along any one of a divergent series of paths. Accordingly it is less likely to strike upon any one particular path that is required at the moment. It is like being in a town and having to find one's way out in a particular direction, instead of being outside and having to find the way into it. The multiplicity of paths which was an advantage in the one case is a hindrance in the other. The errors of confusion into which children are apt to fall when, in repeating a poem, singing a tune from memory, and so forth, they go off on a wrong mental tack, are due to the fact that certain members of the series they are recalling, e. g., phrases of the poem or of the tune, enter into other associations, and so lead their minds astray. This effect of association in leading the mind away from what is wanted has been marked off as *obstructive association.*

Active Reproduction: Recollection.—The reproduction of impressions is very often a perfectly passive or mechanical operation, in which there is no control of the process by the will. In many of our idle moments, as in taking a walk in the country, the mind abandons itself to the forces of suggestion.

In contrast to this passive reproduction, there is an active reproduction in which the will co-operates. Here the succession of images is still ultimately determined by the laws of association. The will can not secure a revival of any impression except by the aid of these laws. A child, for example, can not recall yesterday's lesson simply by resolving, if the lesson has not previously been learned and connected with other knowledge. But he can by an effort of will guide and control the operations of his mind at the time, and so aid in the reproduction of what he has learned. This active side of reproduction is best marked off as recollection.

The will exerts itself here in an act of mental concentration, which serves to give greater distinctness and persistence to what is before the mind. Thus, if a child is asked the date of a certain battle, he may by an act of concentrated attention give clearness and fullness to the image of the battle. And by so doing he helps to give effect to the associative force connecting the event and the date. Not only so, the will accomplishes an important work in resisting obstructive associations, turning away from all misleading suggestions, and following out the clews. The revival of an impression, as of a name, or an event, is very often a gradual process. We are often dimly aware beforehand of the character of the impression or fact we desire to call up clearly. And by a resolute effort we may keep pursuing the right path till we reach it.

It is not only in this form of a severe effort to recall what is temporarily forgotten that the co-operation of the will is important. It enters, in a less marked manner, into all our ordinary processes of mental reproduction. Even in repeating a well-learned poem the child's will, by an effort so slight that he may be scarcely aware of it, steadies the whole operation, securing the due succession of the several members of the train, and the avoidance of misleading suggestions. And the relaxation of this attitude of attention at any moment would be fatal to the reproduction.

This ability to control the reproductive processes reaches its highest development in a habit of going over the contents of memory, and following out, now one path, now another, according to the purpose in hand. It is this ability which is illustrated in the readiness of a child to find facts associated with a particular place or period, examples, analogies, etc., when called upon to do so. This ready command of the mind's store of knowledge by the will presupposes that there has been an orderly arrangement of the materials, that when new acquisitions were made, these were linked on (by contiguity and similarity, to old acquisitions. It is only when there has been the full co-operation of the will in this earlier or acquisitive stage that there can be a ready command of the materials gained in the later stage of reproduction.

CHAPTER X.

MEMORY (CONTINUED).

Memory and its Degrees.—Memory is the power of retaining and reproducing anything that has been impressed on the mind, whether by way of the senses or through the medium of language. Its laws were considered in the foregoing chapter. We have now to examine into the several varieties of this mental power, and its mode of development.

The degree of perfection with which we remember anything may be measured by two main tests—(1) the length of time during which the mind retains the impression, and (2) the degree of distinctness of the images recalled and the readiness with which they are recalled. A child remembers well when he remembers long and permanently. And he remembers well when he can call up distinctly what he has learned.

Although we commonly speak of memory as if it were a simple indivisible faculty, it would be more correct to say that it consists of a number of distinct powers, as the retention of sights, sounds, and so forth. It is one thing to recall a musical sound or a series of such sounds, another to recall a group of visible objects. There are as many compartments of memory as there are kinds of impression. Thus there is a memory for visual impressions, and another for auditory impressions. Within the limits of one and the same sense, too, there are distinct differences of memory. Thus the memory for colors is different from the memory for forms, the memory for musical sounds from the memory for articulate sounds. In addition to these retentions of passive impressions there are retentions of active experiences, as our various manual movements and our vocal actions.

Speaking generally, and disregarding for the present individual differences, we may say that the higher the sense in point of discriminative refinement the better the corresponding memory. We appear to recall sights best of all. Our knowledge of things is largely made up of visual pictures. Next to sights come sounds. As pointed out above, words play an important secondary part in the memory of things. Then follow touches, which are less easily revived, and finally smells and tastes,* which are only faintly revivable. Further, since the muscular sense is characterized by a high degree of refinement, the retention of our active experiences is in general relatively good. It must be remembered, too, that our muscular experiences are uniformly accompanied by passive impressions, and that these serve materially to support the retention. Thus the child recalls the manual movements involved in writing or in playing the piano, by the aid of *visual* images of his moving hands.

Beginnings and Growth of Memory.—Memory presupposes a certain exercise of the senses and the growth of perception. Images do not appear till sense-knowledge has reached a certain stage of development. The inability of the infant mind to keep up an image even a short time after an impression is illustrated in the fact that after examining a biscuit-tin and finding nothing in it, it will presently put its hand in again, quite losing sight of its previous experience. On the other

* It has often been remarked that though we dream of banquets, it is the *look* of the delicious viands that we imagine rather than their flavors.

hand, children, even in this early period, clearly display the lower form of retentive power, viz., that of recognizing objects when they reappear after an interval. Thus a child less than three months old will remember the face of his nurse or father for some weeks. The first distinct images are the result of many accumulating traces of percepts. They are such as are closely associated with, and so immediately called up by, the actual impressions of the moment. The interesting experiences of the meal, the bath, and the walk are the first to be distinctly represented. As the interest in things extends, and the observing powers grow, distinct mental pictures of objects are formed. A child of three months who had been accustomed to watch a bird singing in a cage, when it happened to see the cage without the bird, showed all the signs of bitter disappointment.*

Repetition of Experience.—As experiences repeat themselves and traces accumulate, the mental images become more distinct, and are more firmly associated ; also the number of representations and of associative links increases. The learning of the meaning of words, which begins about the age of six months, i. e., several months before the actual employment of them, greatly enlarges the range of suggestion.† After this the mother or the nurse is able to call up the image of absent objects, such as persons or animals, by talking of them. The repetition of conjunctions of experience further brings about whole groups and series of representations. The child's mind is able to pass not only from the actual impression of the

* M. Perez, "The First Three Years of Childhood," p. 147. Mr. Darwin, in some notes of one of his children, records the first distinct appearances of ideas or images at five months. At this age the child, as soon as his hat and cloak had been put on, became very cross if not taken out at once.

† Mr. Darwin's boy at the age of seven months would turn and look at his nurse when her name was pronounced.

moment to the image of something immediately accompanying it, but from this last to another image, and so on. Thus a child of eighteen months will mentally rehearse a series of experiences, as those of a walk: "Go tata, see geegee, bowwow," etc.

New Experiences.—The child's experience is not a mere series of repetitions. There is a continual widening of the range of objects and impressions. This extension is due in part to the expansion of his interest in things, and in part to the changes in his environment. In this way fresh materials are being stored up in the memory. And the growth of memory shows itself in the increasing range and rapidity of these new acquisitions.

These two aspects of the growth of memory, the attainment of a firmer hold on what has been learned, and the extension of the area of acquisition, are to a certain extent opposed. The further fixing of the old uses up mental energy required for adding new elements to the stock of acquisitions. The conservative tendency in memory works against the progressive. And conversely, the throwing of mental energy into the work of acquiring new knowledge tends to the displacement of the old. This latter effect is more manifest in early life.* The child has his past impressions rendered indistinct by the flood of new ones that excite his interest and engage his mental energy. This effect, however, becomes less noticeable as his powers gain in strength. A child of six or eight years manages to lay up new materials with far less loss of old ones than one of three or four. And this advantage is due not merely to an improvement in the capacity of memory, but in part to an increased ability to discover the links of association between the new and the old.

How Memory Improves.—This process of growth, this continual increase in the store of acquisitions, implies

* In old age the other effect, the exclusion of new acquisitions by a tenacious clinging to the old, is most apparent.

an improvement in the power of seizing and retaining new impressions. By this is meant that any particular acquisitive task will become easier, and that more difficult feats of retention will become possible.

The progress of retentive and reproductive power may be viewed under three aspects. First of all, impressions will be acquired or stored up more readily (for a given time). Less concentration and fewer repetitions are needed for the fixing of an impression. Or, to put it otherwise, a given amount of concentration and repetition will lead to a storing up of more material, that is, more complex groups of impressions. This may be called increased facility in acquisition. Secondly, impressions are retained longer. A given amount of effort in the acquisitive stage will result in a more enduring or permanent retention. This aspect may be marked off as an increase in the tenacity of memory. Thirdly, this progress implies a more perfect form of revival. That is to say, impressions will be recalled more readily and with a higher degree of distinctness and fidelity than formerly.

Causes of Growth of Memory.—This increase in retentive power is due to some considerable extent to the spontaneous development of the brain powers. All mental acquisition appears to involve certain formations or structural changes in the brain. The capability of the organ of undergoing these changes, or what has been called its plastic power, increases rapidly during the early part of life. Impressions of all sorts stamp themselves more deeply on the mind of a child ten years old than on that of a child three or four years old, owing to this greater plasticity of the brain. This condition explains the precocity of memory. It is commonly said that the power of storing up new impressions reaches its maximum in early youth, and the fact is undoubtedly connected with the physiological fact that later on the structure of the brain is more set, or less modifiable.

While the development of memory is thus dependent on the gradual unfolding of the plastic power of the brain, it is not wholly determined by this. A child whose faculties were not duly exercised by the supply of external objects, and of impressions to be stored up and recalled, would not attain to the normal degree of retentive power of his years. The actual progress of memory, the improvement in the aptitude to acquire and reproduce knowledge, is the result of a constant exercise of the faculty. The precise effects of this exercise will be spoken of presently when we come to consider the different directions in which memory is susceptible of development.

Varieties of Memory, General and Special.—There is probably no power which varies more among individuals than memory. The interval which separates a person of average memory from one of the historical examples, as Joseph Scaliger, Pascal, or Macaulay, seems scarcely measurable.*

One person's memory may differ from another's in a number of respects. In the first place, one learner may exhibit more of one of the properties of a good memory specified above. For example, one boy will be quick in acquiring, but not correspondingly tenacious, illustrating the saying "easy come, easy go." Another boy will retain firmly what he has once thoroughly learned, but be wanting in readiness in bringing out and using what he knows. On the other hand, a boy may show himself particularly smart in recalling and displaying his knowledge, and yet, like many a fluent talker, be only a superficial learner. These differences give well-marked peculiarities of character to the memories of different individuals.

In the second place, there are very distinct differences

* Casaubon says of Scaliger: "He read nothing (and what did he not read?) which he did not forthwith remember." Pascal says he never forgot anything which he had read or thought.

amcng children and adults with respect to the range of memory, or the amount and variety of material which can be retained. Some persons of exceptional endowment have a good average power of retaining impressions of all kinds, whereas there are others who have a low average capacity. This would be called a difference in *general memory*.

From these differences in average power of retentiveness we may distinguish differences in special directions, or *special memory*. Thus, for example, one boy will be found to have a good retentive power for impressions of sight or of hearing as a whole, whereas others will show a deficiency on this side. Or, again, a child may display special aptitude in retaining some particular variety of these, as impressions of color or of musical sound. Or, once more, our memory may display particular strength in the retention of some circumscribed group of objects, as faces. In this way arise what are known as the musical memory, pictorial memory, the memory for faces, scenery, etc. As illustrations of such exceptional retentive power in particular directions, may be mentioned Horace Vernet and Gustave Doré, who could paint a portrait from memory ; Mozart, who wrote down the "*Miserere*" of the Sistine Chapel after hearing it twice.

Even differences in general power of memory probably turn to a considerable extent on special differences, namely, in verbal retention. Although to recall words is not the same as to recall things, the latter operation can not be carried on to any considerable extent apart from the former. Hence a large, capacious memory has in all cases been largely sustained by an exceptional verbal retentiveness.

Besides the points of difference just enumerated, there are others which are by no means unimportant. Thus we find that memories vary not only with respect to the particular impressions which are best recalled, but also with respect to the particular mode of grouping which is most successful. Thus, some appear to connect visible objects locally better than others; whereas these last may have a better power of linking together successive pictures answering to events. The former would have a better local, pictorial, or geographical memory, the latter a better historical, or possibly a better scientific memory. Closely connected with these differences are those due to the habitual way of committing things to memory, or arranging acquisitions in the mind. Some minds tend to connect things with their adjuncts of time and place, whereas others rather arrange their impressions according to their relations of similarity, cause and effect, etc.

Causes of Difference.—These differences are plainly due either to native inequalities or to differences in the kind and amount of exercise undergone in the course of the past life. There are native differences with respect to the average retentive power, by reason of which one child is from the first capable of retaining impressions of all kinds more easily than another. Such inequalities are no doubt connected with differences in the degree of structural perfection of the organs as a whole, namely, the sense-organs and the brain. As Locke observes, "An impression made on bees-wax or lead will not last so long as on brass or steel." * In addition to these original differences of brain plasticity as a whole, there are special differences connected with the varying degrees of perfection of particular sense-organs. Thus a child with a good natural ear for musical sounds would be likely to retain these impressions better than another child wanting this sense-endowment. And this for a double reason: (1) because such a superiority would imply a finer discriminative capacity in respect of sound (and retentiveness varies roughly with the degree of discrimination); and (2) because this natural superiority commonly carries with it a special interest in the impressions concerned. A child with a good ear for musical sounds will in general take special pleasure in noting their peculiarities.

At the same time it is clear that the differences observ-

* "Concerning Education," § 176.

able in people's memories are due in part to differences of circumstances, exercise, and education. While in the case of every individual the amount of "natural retentiveness" or degree of "brain plasticity" limits the power of memory as a whole, much may be done by suitable exercise to improve the faculty within these limits. The discipline of the school, if judicious, tends very materially to improve the child's memory by developing the potential capacities of his brain.

It is, however, in the improvement of memory in special directions that the effects of exercise are most conspicuous. Assuming the whole retentive power of the individual's brain to be a definite quantity not susceptible of being increased by exercise, it is evident that his special circumstances and education will determine the particular channels into which this brain-energy is diverted. It is well known that the habitual direction of the mind to any class of impressions very materially strengthens the retentive power in respect of these. The blind not only perceive by touch better than those who see, but recall and imagine touches in a way that we perhaps can hardly understand. Owing to this effect of habitual concentration each mind becomes specially retentive in the direction in which its ruling interest lies. Thus every special employment, as that of engineer, linguist, or musician, tends to produce a corresponding special retentiveness of memory.

It is of the greatest importance to understand the precise effects of exercise on the improvement of memory as a whole and in special forms. As already pointed out, there are limits set to the retentive powers of every individual. The whole aggregate of acquisitions is determined by the child's co-efficient of brain plasticity. Consequently, energy used up in strengthening the memory on one side necessarily hinders an equal development of it on other sides. Not only so, the exercising of the memory in any given direction develops certain predominant interests and modes of association which tells against the conquest of a new region of acquisition. Thus, a boy who has been absorbed in linguistic study, in analyzing the forms of verbal structure, is, *pro tanto*, disqualified for a genuine study of literature, as such. His habit of considering grammatical forms would impede the free concentration of the thoughts on the quality of the ideas and of the literary style.*

There is no doubt a set-off against this. All learning is one and the same process. Consequently, the learning one thing well will undoubtedly help the pupil to attain the art of learning things well generally. Thus, the attainment of readiness and skill in mastering materials, in fixing the thoughts, in arranging, and so on, will very materially reduce the labor of learning a new subject.

Again, so far as the new subject presents points of analogy and attachment to the old one, the earlier attainments will of course further the later ones. Thus, a boy who has mastered one science will be better placed for attacking another. This helpful effect, however, is most apparent where the new and the old subjects belong to the same domain of learning. The mastery of a number of languages helps the acquisition of a new one to so large an extent that a man can go on gaining in the power of learning languages long after the period of greatest plasticity of brain is past.

Training of the Memory.—To exercise and improve the memory is allowed by all to be one chief part of the business of the educator, and more especially the school-teacher. Hence it is a matter of importance to understand what is involved in the training of the faculty, and by what methods it may be best effected.

* This is emphasized by Beneke, who observes that "every mental connection already formed, and formed with a certain degree of strength, is prejudicial to the formation of the new connection."

The training of the memory aims directly at exercising the child in storing up and reproducing a quantity of valuable intellectual material, impressions, facts, and truths. This material is obtained either directly by the observation of real things, as in the object-lesson, or indirectly by way of verbal instruction. The more firmly the knowledge is retained, and the more readily and distinctly it is reproduced, the better the training.

Along with this result, the accumulation and mastery of so much knowledge, the educator aims by means of such acquisition at improving the child's power of acquiring and retaining other knowledge than that learned in the process. In other words, he seeks to produce a good type of the acquisitive or learning faculty in general. As Locke puts it, "the business of education is not, as I think, to make them (the young) perfect in any one of the sciences, but so to open and dispose their minds, as may best make them capable of any, when they shall apply themselves to it." * And so far as the teacher makes this wider result his object, he will be guided in his choice of materials, as well as of method, by their fitness to contribute most effectually to the improvement of the learning faculty.

The culture of a child's memory claims the educator's attention from the first. As a precocious faculty it needs to be exercised by the parent before the period of school life. The fact that early impressions are the most lasting makes it specially important that a right direction should be given to the first development of the faculty.†

This regulation of the acquisitive processes may be said to begin with the use of language by the nurse and the mother in naming to the child the various objects of sight. The systematic training of the memory should be first carried out in close connection with observation. The mean-

* "Of the Conduct of the Understanding," ed. by Prof. Fowler, p. 44.

† "Natura tenacissimi sumus eorum, quæ rudibus annis percepimus." (Quintilian.)

ing of words should be taught by connecting them with the real objects, that is to say, by simultaneously naming and pointing out an object. The naming of the properties and effects of things is an important completion of the object-lesson. As supplementary to this, the child should be exercised in recalling by means of words the impressions directly received from external objects. The parent can do much to develop the memory of the child by encouraging him to describe what he sees, to narrate the day's experience, and so forth.

After a sufficient store of first-hand knowledge has thus been accumulated, the memory should be trained in the acquisition of knowledge about things at second-hand, that is to say, through the medium of instruction. The early period of school life is said to be the most favorable one for the building up of such verbal acquisitions. It costs less effort in this early stage of development to learn the concrete facts of history, geography, or language, than it would cost at a later date. Hence it has been called the "plastic period." *

In training the memory the different characteristics of a good memory should be kept in view. These, as already pointed out, are: (1) aptitude in applying the mind to a subject and acquiring knowledge; (2) a firm grasp of what is thus learned, or tenacity of memory; and (3) readiness in recalling and making use of what has been stored up in the mind. To this some would add a fourth excellence, viz., fidelity or accuracy in reproduction. † A

* Prof. Bain regards the period of maximum plasticity as extending from about the sixth to the tenth year. ("Science of Education," p. 186.)

† Quintilian says, "Memoriæ duplex virtus: facile percipere et fideliter continere." Dugald Stewart distinguishes between quickness, tenacity and readiness ("Elements of the Philosophy of the Human Mind," chap. vi, § 2). J. Huber adds the fourth excellence, fidelity ("Ueber das Gedächtniss"). Mr. Quick has pointed out that a good memory brings "into consciousness what is wanted, and *nothing else.*"

glance at these suggests that there are two main divisions in the art of training the memory: (*a*) the calling forth of the pupil's power of acquisition, or aptitude in storing up knowledge; (*b*) the practicing him in recalling what he has learned. In respect of each part, a judicious and effective training will proceed by recognizing the natural conditions of retention and the particular stage of development reached. Although in practice these run on together, we may, to a certain extent, treat them as separate processes.

(a) Exercise in Acquisition.—In this stage the first rule to be attended to is to take the child at his best. Committing anything to memory is a severe demand on the brain energies, and should so far as possible be relegated to the hours of greatest vigor and freshness. The morning is the right time for learning. Heavy preparation work in the evening, especially in the case of young children, is distinctly injurious. At the same time, the practice of refreshing the impressions of the day by going over notes of lessons has undoubted advantages; and many a learner has testified to the fact that rehearsing a lesson before falling asleep is an aid to the lively reproduction of it on the morrow.

The next rule is that every resource should be used to make the subjects to be learned as interesting as possible. The complaints of many distinguished men about the drudgery of school learning may remind us how easy it is to overlook this condition. A large number of boys have, like the old writer Schuppius, taken heart by committing things to memory "in spem futuræ oblivionis." * It has been observed by an eminent living teacher that "the memory of the young is very good if they care for what they are about." In order to secure this condition

* Quoted by Mr. Quick in a highly interesting lecture, on "The Teacher's Use of the Memory." See "Journal of Education," July, 1884.

we must consult the learner's natural tastes to some extent, and keep in view what Locke calls "the seasons of aptitude and inclination." And we must further seek to develop an interest in the subjects studied. The awakening of interest consists not only in developing the intrinsic attractiveness of subjects, but also in helping the child to realize the uses of knowledge, and the power it brings to its possessor. Perhaps one of the chief drawbacks of school as compared with home teaching is that it tends to put the day's lessons so completely outside the circle of home-interests that the pupil comes to look on the knowledge gained as something artificial and unreal. Where, on the other hand, the lessons are given at home and under the supervision of an intelligent mother or father, the attractions of learning are vastly increased by the opportunities opened up for applying it.* The parents should always co-operate with the teacher in seeking to work against this tendency to divorce knowledge from the real interests of life. To a child toiling with the difficulties of French or German, a half-hour's easy chat in that language with the father or mother will bring a stimulus the school-master can never provide. The mere talking over the day's lesson with a sympathetic parent is a powerful encouragement. Dr. Johnson tells us that when a child he used, after acquiring a new piece of knowledge, to run and tell it to an old woman of whom he was fond, and that this practice helped to imprint what he learned on his memory.

Again, in training the memory a judicious use must be made of the principle of repetition. This condition should be observed in giving the instruction. Thus, when the teacher writes the chief points of an oral lesson on the

* Miss Edgeworth emphasizes the importance of cultivating the memory and the inventive faculty together. "Children who invent exercise their memory with pleasure from the immediate sense of utility and success." "Practical Education," vol. iii, p. 101.

blackboard he introduces a new sense-medium, the eye, and so tends to fix the subject by the force of repetition. Revision lessons, going over the work of the term, are another illustration of the value of repetition. In addition to this, the pupils should be encouraged to ruminate on the subject-matter of the lesson after it is over, to write out an epitome of it, and to talk it over. And here again the parent may supplement the work of the teacher. The advantage of writing out and giving an oral account of what has been learned, soon afterward, is that it requires a steady concentration of the thoughts on the subject. Any system of instruction that does not allow adequate time for this mental brooding over new acquisitions is condemned on that account. All hurry in getting over the ground is fatal to permanent recollections. Seneca observes: "Dediscit animus sero quod didicit diu."[16]

Lastly, the educator should make ample use of the laws of association. This includes two things: (1) the connecting of the several parts of the new matter in the best possible way one with another; and (2) the connecting of the new acquisition with the old. Thus, in teaching a geographical fact, say the position of Liverpool, its relations to other places, as America, Manchester, etc., should be made clear. Similarly, in narrating an historical event its several actions and incidents should be clearly set forth in their order of time, also the antecedent and attendant circumstances fitted to throw light on the causes of the event be added. There should, moreover, be a certain order of procedure, the more important events being used as a central thread about which the subordinate events are entwined. In this way the materials are arranged, and the retention greatly promoted.

Again, in connecting the new with the old, all available aid should be derived from tracing similarities under the form of analogies, e. g., between the Norman invasion of England and the earlier invasions. As supplementary to this, the teacher should bring out the points of difference and contrast between the events, e. g., between the effects of the Saxon and Norman invasions on the population of the island. We thus see that the most effectual way of arranging the materials for purposes of retention is precisely that which best subserves the understanding of the whole.*

Learning by Heart.—Among the most constant of the associations resorted to by the teacher are the verbal ones. Teaching necessarily proceeds by the medium of language. And the pupil helps to remember what he learns by the aid of words. The full use of these verbal associations is seen in what is known as learning by heart. This implies that the learner firmly retains a piece of knowledge in a definite verbal form, which form serves as a support of the ideas acquired as well as a medium for reproducing these. The learning of the multiplication-table, grammatical rules, and poetry illustrates the process.

There is an obvious danger in this mode of learning; it tends to a mechanical habit of committing words and not ideas to memory. That is to say, the mind of the learner uses the verbal series not simply as a support of, but as a substitute for, the sequence of ideas. This parrot-like mode of learning is particularly insidious, because it appears to save the learner, and certainly saves the teacher, a good deal of trouble. The verbal memory is strong in children, and they are prone to lean on it to excess; and it is plainly a much simpler problem for the teacher to test whether a child has retained the verbal form than whether he has grasped the ideal substance. Owing to these and other reasons, such as the greater value attached to the verbal memory when books were

* Miss Edgeworth remarks that the order of time is the first and easiest principle of association. Arrangement according to logical connection will follow later. "Practical Education," vol. iii, p. 92.

scarce, the older method of teaching was characterized by the predominance of merely verbal acquisition. And the chief direction of modern educational reform has been the substitution of a real knowledge of things for a mere knowledge of words. Hence the practice of learning by heart has fallen into disfavor. "Learning by heart," says Locke, ". . . I know not what it serves for but to misspend their time and pains, and give them a disgust and aversion to their books."[17] Pope satirizes the practice in the "Dunciad":

> "Since man from beast by words is known,
> Words are man's province, words we teach alone."

It is probable that this revolt from the tyranny of words has led educationists to undervalue the real service of language in learning. In many cases the embodiment of knowledge in a precise verbal form is necessary, e. g., in arithmetical and other formulæ, the rules of grammar, the laws of science.* And in every case the verbal memory should be allowed a certain play. As was pointed out above, the men who have been most remarkable for learning have been greatly helped by their verbal memory. And in early life, when the aptitude of committing words to memory is so strong, it would be folly to make no use of it in education. What the teacher has to take care of is, that he does not use the child's verbal memory to urge him on to learn what he can not yet understand; that the ideas are firmly retained along with the words, and that the pupil is not slavishly dependent on them, and can put his knowledge into other forms when required.

It might be well to distinguish between learning *by heart* and learning *by rote*, confining the former to the legitimate practice of learning *by help of* a definite verbal form, and reserving the latter for the pernicious practice

* This has been well illustrated by Mr. Fitch. "Lectures on Teaching," p. 131, and following.

of learning words *instead of* the facts and truths they represent. Thus, in committing a poem to memory, it is important to distinguish an accurate reproduction of the whole poem, words and ideas, from the parrot-like reproduction of the mere sounds. It is evident that the former is by far the more interesting exercise. And it may be added that in reality it is the easier too. Where the child has only the verbal associations to help him, he is much more likely to forget than when he grasps the meaning too, and so has as an additional aid to recollection in the links of connection that join together the successive ideas —a fact that might easily be tested by giving a child first a poem dealing with a very abstruse subject and quite above his comprehension, and afterward a simple and attractive ballad.*

Art of Mnemonics.—In ancient times great importance was attached to certain devices for aiding memory and shortening its work, which devices have been known as artificial memory, *memoria technica*, and the art of mnemonics. Thus, among the Greek and Roman teachers of oratory, much emphasis was laid on a *topical* memory, i. e., the connecting of the several heads of a discourse with different divisions of a house or other building, so as to recover them by the aid of visual pictures of these places. And in modern times attempts have been made to shorten the process of learning, dates, etc., by mnemonic word-forms, and lines. This idea of relieving memory owed much of its apparent importance to the theory that the main business of learning is to commit words to memory. When this theory obtained, learning was necessarily a dry occupation, and the pupil's mind was wearied by excessive tasks in verbal acquisition.

* Strictly speaking, what is called learning by rote derives some assistance from the associations of the ideas. As Jean Paul Richter dryly observes, word-memory, as distinct from thing-memory, would be best tested by committing to memory a sheet of Hottentot names.

Hence the eagerness to find devices for shortening the toil. Now, that this theory is abandoned, less importance is attached to a mnemonic art. When things are taught only in so far as they can be understood, it is held that the relations of place, time, cause and effect, etc., between the facts should form the main basis of acquisition. In other words, the more things are connected in their natural relations, the less will be the task imposed on the verbal memory.*

Although there are no definite rules for aiding the memory which are valid in all cases, there is such a thing as a skillful management of the memory. This will include the formation of habits, not only of concentration and repetition, but of selecting and grouping or arranging. Memory-labor is greatly economized by detecting what is important and overlooking what is unimportant. When Simondes offered to teach Themistocles the art of memory, the latter answered, "Rather teach me the art of forgetting." Children are apt to overload their minds with useless matter, and they should be exercised in selection. The labor of memory is lightened, too, by finding appropriate "pegs" on which to hang new acquisitions. Among these pegs must be reckoned the places in which information can be found. To associate book-knowledge with particular books, and places in these, other kinds of knowledge, with particular persons (experts), is a great saving of memory-labor. This has been called the index-memory.

Learners will unconsciously further the work of learning by all manner of devices that can not readily be reduced to a definite formula. Thus, one child in learning

* For an account of the different systems of mnemonics, see article "Mnemonics," "Encyclopædia Britannica," and article "Memory," in "Chambers's Encyclopædia"; and for a critical inquiry into the value of artificial aids to memory, see Dugald Stewart's "Elements of the Philosophy of the Human Mind," chap. vi, § 7.

that the Tudors are followed by the Stuarts will notice the odd sequence, T. S.; and by so doing will retain the succession more easily. In learning a foreign language, the pupil will often shorten the labor by discovering slight and fanciful resemblances between the new vocables and familiar words in his mother-tongue. Such devices are perfectly allowable so long as the subject-matter is connected in an arbitrary way only, as in the case of names of sovereigns, chief towns, etc., lists of irregular verbs, and so forth. They only become mischievous when they draw off the attention from natural and logical relations. Where the matter committed to memory is such as requires to be learned in a definite verbal form, the use of alliteration and verse-form, as in the well-known mnemonic lines in grammar, logic, etc., is a valuable aid to the memory.

The aids thus resorted to will differ in the case of different children. Some children will remember ideas better by the aid of visual pictures, others better by series of sound-representations. The young are wont to help themselves out of the difficulty of retaining what is difficult, e. g., letters, numbers, dates, by the aid of visual forms (geometrical schemes, and so on). And teachers would do well to find out these spontaneous tendencies of children's minds, and to aid them in the process of economizing intellectual labor.[18]

(b) Exercise in Recalling.—In addition to exercising the child in committing to memory, the teacher has to exercise him in reproducing what has been learned. He does this for a variety of reasons. First of all, he requires to test the child's power of retention and the tenacity of his memory. Again, he continually needs to recall past acquisitions in order to make sure of taking the pupil on to an intelligent grasp of new ones. In expounding any subject, the elements learned at the outset are required from time to time as the pupil advances to the higher stages. And here the child should be required to reproduce for himself. Lastly, it is desirable to examine children in a wider and more searching way as to what they have learned, with a view to make them ready in looking up facts when they are wanted, finding illustrations of principles, and so forth. Such exercises tend to develop readiness in reproduction, a quality hardly less valuable than retention; for, as Locke observes, "the dull man who loses the opportunity while he is seeking in his mind for those ideas that should serve his turn, is not much more happy in his knowledge than one that is perfectly ignorant."

This part of the training of the memory should be carried out partly by the parents and partly by the schoolteacher. The home can be made the field of such exercise by encouraging the child in recalling what he has momentarily forgotten, in recounting his experiences, in giving a sketch of his day's lessons, and so forth, and thus practicing him in the voluntary command of his acquisitions, in clearness and accuracy of description, and in an orderly method of arranging his materials. But it is to the teacher that we must look for the systematic exercise of the memory in this respect. Skill in putting questions and in examining is one chief qualification of a good educator. How to separate real from merely verbal knowledge, and thorough knowledge from a superficial smattering; how to eliminate the effects of hasty "cram" and to make sure of a firm, tenacious grasp of knowledge; how to test the valuable quality of promptness in reproduction, without discouraging those who are tenacious though slow—these are among the difficult problems of the modern teacher[19] and examiner.

Subjects which exercise the Memory.—All branches of study exercise the memory in some measure. The student of the higher mathematics remembers the principles and the demonstrations of his science, and this largely by the aid of language or other visual symbols.

But when we talk of a subject exercising the memory we mean more (or less) than this. We refer to those subjects which have to do mainly with the particular, and the concrete, and which appeal but little to the understanding. Such subjects are natural science, in its simpler or descriptive phase, geography, history, language, and the lighter departments of literature. Arithmetic, though now recognized as a subject which necessarily calls forth the child's powers of generalizing and reasoning, also makes heavy demands on the verbal memory.

As was pointed out above, exercise tends to improve the capacity of learning in particular directions rather than as a whole. A pupil who has exercised his memory mainly in the study of literature, though he will have greatly strengthened it in the further acquisition of this kind of knowledge, will not have materially added to his capacity of learning other subjects, as natural science.

It would seem to follow from this that a full and complete exercise of memory involves the taking up of a number of subjects, as literature, science, and so on. A certain range and variety of subjects is thus good for the learner. At the same time, a considerable number of disconnected subjects carried on together is prejudicial to the memory, by preventing that firm joining together of elements into a compact whole which is the condition of the best kind of memory. "Aiunt," writes Pliny, "multum legendum esse, non multa." Locke held that the true secret of learning is to learn one thing at a time; and so admirable a scholar as Lessing tells us he followed this rule in his self-education. And it is very doubtful whether our modern fashion of introducing so many new subjects at the same time is the most efficient method of training the memory.

Educational Value of Memory.—The value set on the training of the memory at different times and by different writers has been a very different one. The old idea was to identify memory and knowledge. "Tantum scimus quantum memoria tenemus." As already observed, to know a thing implies that an impression is retained. Knowledge is the more or less permanent after-result of a past process of learning or coming to know. This is apparent to all. The difficulty begins when we ask what is the relation of memory to the higher faculties of judgment, imagination, etc., and to that fuller knowledge which we call understanding. That a certain development of the memory is necessary to the due discharge of the higher intellectual functions follows from the laws of mental development, and will be fully illustrated by-and-by. Unless the mind is stored with a good stock of concrete impressions there will be no materials for the imaginative or inventive faculty to combine, or for the understanding to reduce to general concepts. As Kant observes, "The understanding has as its chief auxiliary the faculty of reproduction." Every great writer and discoverer has taken pains to cultivate his memory.*

On the other hand, it is a matter of common testimony that the cultivation of memory to a high point may be hurtful to these higher faculties; "beaucoup de memoire, peu de jugement," says the French proverb. Similarly, Pope observes:

> "Thus in the soul while memory prevails,
> The solid power of understanding fails."

This points to a real danger in exercising the memory. Its importance has been, and still is perhaps, greatly overrated. This was the characteristic fault of the old method of loading children's minds with a mass of ill-digested learning.† The precise value of the memory in relation

* Dugald Stewart says he can scarcely recollect one man of genius who had not "more than an ordinary share" of retentive power.

† Miss Edgeworth gives an interesting explanation of the reasons why so much importance was attached to memory up to recent times. "Practical Education," vol. iii, p. 57, etc.

to the understanding of facts and the practical applications of knowledge should never be lost sight of. In training the memory, the teacher should exercise the judgment at the same time in the selection of what is really important. In this way overloading the mind will be avoided, and the higher faculty will be improved. Further, as Dugald Stewart observes in his remarks on what he calls a "philosophical memory," the learner, in committing new materials to memory, should be exercised in that orderly arrangement of acquisitions, and that classification of facts under their proper heads, which is not only a great saving to the memory, but secures in the very process of storing up materials of knowledge a certain amount of exercise of the understanding itself.

APPENDIX.

On the laws of memory and on its culture the reader will do well to consult Dugald Stewart, "Philosophy of the Human Mind," part i, chap. vi; Dr. Carpenter, "Mental Physiology," book ii, chap. x; and Prof. J. Huber, "Ueber das Gedächtniss." The early development of the faculty is traced by M. Perez, "The First Three Years of Childhood," chaps. viii and ix, and "L'Enfant de trois à sept ans," chaps. i and ii.

The educational management of the memory is dealt with among others by Locke, "Some Thoughts on Education," especially sec. 176; Miss Edgeworth, "Essays on Practical Education," vol. ii, chap. xxi; Mdme. Necker, "L'Education," livre vi, chap. vii; Beneke ("Erzieh. und Unterrichtslehre," vol. i, sects. 20–22); Waitz, "Allgem. Pædagogik," 2d part, 3d sec. There are some good remarks on the cultivation of memory in Kant's Essay, "Ueber Pædagogik." Among recent writers reference may be made to J. G. Fitch, "Lectures on Teaching," chap. v; E. Thring, "Theory and Practice of Teaching," part ii, chap. vii; and G. Compayré, "Cours de Pédagogie," leçon vi. The process of learning by heart is fully dealt with by Dr. J. Hoppe, "Das Auswendiglernen und Auswendighersagen."

CHAPTER XI.

CONSTRUCTIVE IMAGINATION.

Reproductive and Constructive Imagination.—In the act of reproduction the mind pictures objects and events by means of what are called images; and thus reproduction is a form of imagination. But what is popularly known as imagination implies more than this. When we imagine an unfamiliar coming event, or a place which is described to us, the images in our minds are not exact copies of past impressions. The results of our past experience, or the contents of memory, are being in some way modified, transformed, and recombined. Hence this form of imagination has been marked off as productive imagination.

This process of producing new images and groups of images out of old materials appears in a number of different forms. In its lower developments it is a comparatively passive process, in which the will takes no part, and the movements of which are capricious and swayed by feeling. The childish fancy illustrates this lower variety. The higher form is an active process, in which the will directs the several steps to a definite result. This more perfect form of imaginative activity is known as constructive imagination.

The Constructive Process.—This process of construction may be said roughly to fall into two stages. (*a*) Of these the first is the revival of images of past objects, scenes, etc., according to the laws of association. Thus, a child, in building up an idea of Africa, of the Spanish Armada, and so on, necessarily sets out with facts of his own experience recalled by memory. It is the same with his more fanciful creations of fairy-land and its inhabitants.

It follows that the excellence of the constructive process is, in every case, limited by the strength and clearness of the reproductive faculty. Unless memory restore the impressions of past experience we can not picture a new scene or a new event. Thus, unless a child recalls, with some measure of distinctness, one or more of the blocks of ice which he has actually seen, he can not imagine an iceberg or a glacier. The more readily the reproductive faculty supplies the mind with elements, the better the result is likely to be.

(*b*) The images of memory being thus recalled by the forces of suggestion, they are worked up as materials into a new imaginative product. This is the formative or constructive act proper. The process resembles that of building a new physical structure out of old materials. These have to be broken up, what is useless rejected, what is useful and congruous with the rest selected, and the whole put together in an orderly way so as to build up a new structure.

This part of the process is the work of the will, guided by a clear representation of the result aimed at, and by a steady judgment as to what is fitting for the purpose in hand. And it is on the quality of this guiding sense of fitness that the excellence of the result mainly depends. When this is wanting, the materials supplied by reproduction remain in a disorderly mass, and confuse the mind. And the more completely the will, directed by the sense of what is fitting, masters the chaos, the more perfect the final formation. According as a poet, for example, has a clear and discriminating, or a dull and obtuse, sense of what is beautiful, harmonious, etc., his constructive work will be well or ill performed.

This constructive activity assumes a lower and a higher phase. In the case of a child listening to a story it is directed from without, and subserves the *reception* of knowledge. In the case of a poet creating a new scene or action it is directed from within, and subserves *origination.*

Various Forms of Construction.—The essential process in imagination, viz., construction, enters into a variety of mental operations. These may be grouped under three main heads: (1) construction as subserving knowledge about things; (2) practical construction as aiding in the acquisition of knowledge how to do things, or to adapt means to ends; and (3) construction as satisfying the emotions. The first may be called the intellectual imagination; the second, the practical imagination or invention; and the third, the æsthetic or poetic imagination.

(A) Intellectual Imagination.—Every extension of knowledge beyond the bounds of personal experience involves some degree of imaginative activity. This is seen alike in the *acquisition* of new knowledge from others respecting things, places, and events, and also in the independent *discovery* of new facts by anticipation. The first is the lower or receptive form of imagination, the second the higher and more originative.

(1) Imagination and Acquisition.—The process of recalling, selecting, and regrouping the traces of personal experience is illustrated in every case of acquisition. What is ordinarily called "learning," whether by oral communication or by books, is not simply an exercise of memory; it involves an exercise of the imagination as well. In order that the meaning of the words heard or read may be *realized*, it is necessary to form distinct mental images of the objects described or the events narrated.

Thus, in following a description of a desert, the child begins with familiar experiences called up by the words "plain," "sand," and so on. By modifying the images thus reproduced by memory he gradually builds up the required new image.

It may be noted that here as elsewhere knowledge consists in discriminating and assimilating. The child has to assimilate what is told him in so far as it is like his past observations, and at the same time to note how the new scene differs from the old ones. The formation of a distinct and accurate image will greatly depend on the degree of perfection attained in this part of the process. In following a description children are apt to import too much into their mental picture, taking up the accidental associations with which their individual experience has invested the words used. And by so doing they do not sufficiently distinguish between the new and the old. That is to say, the process of selection is incomplete.

On the success of this imaginative effort depends to an important extent what is known as the *understanding* of the description. If, for example, the mind of a child, in following a description of an iceberg, does not distinctly realize its magnitude, he will not be prepared to understand the dangers arising to ships from such a floating mass. Here we see the close relation between clear imagination and clear thinking—a relation to be spoken of again by-and-by.

Reducing the Abstract to the Concrete.—This imaginative realization of an object or process by the aid of descriptive terms is exceedingly difficult. Language is in its nature general and abstract. Hence all verbal description involves a gradual process of reducing lifeless generalities to a living concrete form. This is effected by adding to the general name a number of qualifying terms, each of which helps to mark off the individual thing better from other things. Thus the teacher, in describing a desert, probably begins by some general term, as a big place, and gradually makes this definite and concrete by adding limiting or qualifying epithets, such as flat, bare, and so forth. In like manner, in describing a king or a statesman, he progressively individualizes the person by enumerating his several physical and mental qualities, such as tall, handsome, wise, and so forth. The process of realizing the description turns on the *combination* of those several qualities into a concrete object. The scientific description of a new animal or plant by means of a highly technical terminology illustrates the difficulties of this process of "concreting the abstract" in a yet more marked manner.

(2) **Imagination and Discovery.**—The discovery of new facts is largely a matter of careful observation and patient reasoning from ascertained facts and truths. Yet imagination materially assists in the process. The inquiring, searching mind is always passing beyond the known to the unknown in the form of conjecturings. To guess a fact, whether it be a fact of the world around us or something known to another, involves the bringing together of elements of previous knowledge, combining these in certain ways, and so feeling our way by a series of tentatives to the particular combination required. The power of thus divining what is hidden by the activity of imagination is variously known as insight into things and inventiveness. The child shows the germ of this capability when picturing to himself the make of his toys, the mechanism of the clock or the piano, the way in which plants nourish themselves and grow, and so on. The scientific discoverer shows it in a higher form in inventing hypotheses for the explanation of facts, and in imagining the as yet unobserved results of his reasoning processes.

(B) **Practical Contrivance.**—A process of construction enters into the several departments of practical acquisition, such as learning to use the voice in speaking and singing, manual contrivances and inventions, both useful and mechanical on the one hand, and artistic on the other hand. In these various exercises of practical skill and contrivance the child is called on to recall what has been already learned, and to separate and recombine this in conformity with new circumstances and new needs. A good deal of the child's mental energy finds its natural vent in the direction of practical contrivance or invention.

Much of this new motor acquisition is guided by others' actions. The impulse of imitation leads a child to attempt the actions which he sees others perform. This is seen plainly enough in his play, which is largely a mimicry of the serious actions of adults. This is the receptive side of practical construction. The exercises of the school, such as singing, writing, the movements of drilling, and so forth, illustrate the same process. The simpler actions of the voice, fingers or limbs, which are already mastered, are combined in more complex operations under the guidance of an external model or copy.

From this lower and receptive form of practical contrivance we must mark off that higher and more original form which we know as free invention. Children find out many new combinations of movement for themselves. The mere pleasure of doing a thing, and of overcoming a difficulty, is an ample reward for many an effort in practical construction. Such activity is, moreover, closely connected with the impulse of curiosity, the desire to find out about things, their structure and less obvious qualities. In this way practical invention assists in the discovery of facts and truths. A considerable part of a boy's knowledge of things is thus gained *experimentally*, that is to say, by means of actively dividing, joining together, and otherwise manipulating objects.

(C) Æsthetic Imagination. — Æsthetic or poetic imagination is distinguished from the other forms in being subservient, not to the pursuit of knowledge, whether knowledge about things or knowledge how to attain results, but to emotional gratification of some kind. It involves the presence of some feeling, such as love or admiration for the beautiful, and it is this feeling which constitutes its stimulus and controlling force. This is illustrated in the wild dreams of the romantic boy or girl. The productive work of imagination, by bringing enjoyment to the mind that indulges in it, strengthens the force of the stimulating emotion, and so tends to sustain and intensify itself.

We have seen that imagination is able (within certain limits) to vary or transform the actual events of our experience. Under the stimulus of an emotion, such as the love of the marvelous or the beautiful, imagination is wont to rise above the ordinary level of experience, and to picture objects, circumstances, and events surpassing those of every-day life. The ideal creations of the imagination are thus apt to transcend the region of sober fact. The child's fairy-land and the world of romance, which the poet and the novelist create for us, are fairer, more wonderful and exciting than the domain of real experience.

Risks of Uncontrolled Imagination.—The indulgence in these pleasures of imagination is legitimate within certain bounds. But it is attended with dangers, moral and intellectual. A youth whose mind dwells long on the wonders of romance may grow discontented with his actual surroundings, and so morally unfit for the work and duties of life. Or, what comes to much the same, he learns to satisfy himself with these imaginative indulgences; and so, by the habitual severance of feeling from will, gradually becomes incapable of deciding and acting, a result illustrated by the history of Coleridge and other "dreamers." This constitutes a serious moral danger.

Again, an unlimited indulgence in the pleasures of imagination is attended with grave intellectual dangers

So far as imaginative activity is liberated from the control of will and judgment, and given over to the sway of emotion, it hinders the attainment of truth. In extreme cases it leads to such an exaggerated realization of the objects imagined as to give rise to delusion, as in the case of the dreamy child and the novel-reader.[20] And, when it falls short of this, the sway of feeling gives such a violence and a capriciousness to the movements of imagination as to unfit it for the calm and steady pursuit of truth. Strong feeling prevents a clear discriminating vision of facts, and leads to vagueness and exaggeration. Thus, if a child is powerfully affected by the pathetic aspect of an historical incident, as the execution of Mary of Scotland, his mind, fascinated by this aspect of the event, will be unfitted to imagine fully and impartially all the essential circumstances of the case, so as to arrive at a complete grasp and understanding of the whole.

Intellectual Value of Imagination.—It has been customary to oppose the imagination to the understanding. To the ordinary practical intelligence the imagination seems a useless ornamental appendage to the mind, serving, like the peacock's tail, only to retard its progress. And writers on the human mind have followed the popular judgment in taking a low view of the intellectual services of this faculty. That there is a certain measure of truth is now apparent. Imagination, when given over to the caprices of feeling, is antagonistic to the pursuit of knowledge. At the same time, the view that imagination is uniformly opposed to intellect is erroneous, and has its roots in the more abstract psychology of an earlier age, according to which the mind is a bundle of disconnected faculties. A deeper insight into the organic unity of mind, and into the way in which different forms of mental activity combine in what looks like a simple operation, shows us that imagination, instead of lying wholly outside of intellect, constitutes an integral factor in intellectual processes.

Development of Imagination.—Just as memory only begins to develop when the faculty of perception has been exercised up to a certain point, so imagination only distinctly appears when memory has attained a certain stage of perfection. This applies alike to construction as concerned with objects and with actions. The child must be able to recall distinctly a number of previous sense-experiences before he can build up new pictures of what is going to happen, or strike out new combinations of movement.

Germ of Imagination.—In a sense the infant may be said to show the germ of imagination when letting his mind dwell on an absent object, as the mother who has just left the room, or when he anticipates some new experience, as the taste of an untried fruit; but it is not till language is mastered that the activity of the faculty becomes well marked. It is in listening to the simple narrations and descriptions of the mother or nurse that the child's power of fashioning new images is first exercised. It is noteworthy that children only manifest interest in such narrations after they have been accustomed to a verbal recital of their own personal experiences.* The capability of representing a new series of events depends on the exercise of the reproductive imagination in recalling old successions. But when this power of ready reproduction has attained a certain strength, children display a keen interest in listening to new recitals. They show great liveliness and rapidity of fancy in following and realizing these narrations. As Madame Necker observes, "the pleasure which the narration of the most simple stories affords children is connected with the vivacity of the images in their minds. The pictures which we call up within them are perhaps more brilliant and of richer coloring

* M. Perez observes that a child of twenty months delights in recounting his own little experiences, though he is not yet keen to hear stories. ("First Three Years of Childhood," p. 96.)

than the real objects would be." And this vividness of the mental imagery, and intensity of realization of what is narrated to them, is further shown in the jealous concern they display for fidelity to the original version when a story is repeated.

Children's Fancy.—After a certain amount of exercise of constructive power in this simple receptive form, the child shows a spontaneous disposition to build up fancies on his own account. The marvels which his new world presents to his mind, together with the delightful consciousness of possessing a new power, seem to be the chief forces at work here. At first this activity of fancy manifests itself in close connection with the perception of actual objects. This is illustrated in children's play. Play offers ample scope for practical ingenuity: it is the natural outcome of the active impulses of childhood, its love of doing things and of finding out new ways of doing them. But it owes its interest to another circumstance, namely, that it is a mimicry and kind of make-believe of the actions of adults. When at play the child realizes by an exercise of fancy the objects and actions which he is mimicking. The actual objects supply a basis of reality on which the imagination more easily constructs its fabric. By the "alchemy of imagination," as it has been called, the doll becomes in a manner transformed into a living child, the rude stick into a horse, and so on. A very rough basis of analogy will suffice for these creations of fancy: hence a boy will derive as much pleasure from a broken and shapeless hobby-horse as from the most life-like toy. Play thus illustrates in a striking manner the liveliness of children's fancy. In their spontaneous games they betray the germs of artistic imagination: they are in a sense at once poets and actors.[21]

This exuberance of imaginative activity shows itself commonly too in another form. A child of three or four years who has heard a number of stories will display great activity in modeling new ones.* These fabrications show the influence of the child's own experience and observation as well as of the narratives of others. At this period free spontaneous fancy is apt to assume extravagant shapes. A strong susceptibility to the excitement of the marvelous, and a childish love of what is odd and grotesque, often supply the impelling force in these constructions. Young children are wont to project themselves in fancy to distant regions of space, and to transform themselves into other objects. Thus, a child barely three years was accustomed to wish she might live in the water with the fishes, or be a beautiful star in the sky. The daring of these combinations is to a considerable extent accounted for by the child's ignorance of what is impossible and improbable in reality. To the young mind to fly up into the sky is an idea which has nothing absurd about it. The riotous activity of children's fancy is thus due in part to the want of those checks which a fuller experience and a riper judgment necessarily impose.

Imagination brought under Control.—The progress of experience and the growth of knowledge lead to a moderation of childish fancy. From the first spontaneous form, in which it is free to follow every capricious impulse, it passes into the more regulated form, in which it is controlled by an enlightened will. That is to say, its activity becomes directed by the sense of what is true, life-like, and probable. This shows itself even in the matter of fiction. The old nursery tales cease to please. Stories bearing more resemblance to real life, histories of children, their doings and experiences, take their place. In this way the earlier impulses, the love of the marvelous, the liking

* These fanciful creations are often built up on a slender basis of observation. Thus a little girl (5¾ years) once found a stone with a hole in it, and set to work to weave a pretty fairy-tale respecting it. To her fancy it became the wonderful stone, having inside it beautiful rooms, and lovely fairies who dance, sing, and live happily.

for the grotesque and ridiculous, are replaced by higher motives, a desire to learn about things, and a regard for what is true to nature and life; and this result is seen still more clearly in the gradual subjection of the imagination to the ends of knowledge and truth. As youth progresses, more and more of imaginative activity is absorbed in reading and learning about the facts of the real world.

Later Growth of Imagination.—Although through the development of the powers of judgment and reasoning the child's wild fancy becomes curbed, it is a mistake to suppose that the imaginative powers cease to grow. We are apt to attribute to children a high degree of imaginativeness just because we are struck by the boldness of their conceits. But the same child that performs one of these "feats of imagination" would find it difficult to form a clear mental picture of an animal or a city that was described to him. The power of imaginative construction goes on developing, with the gradual enrichment of the memory, by the fruits of experience, as well as with the repeated exercise of the faculty.[22]

This higher development of the imaginative faculty means, first of all, increased facility in grouping elements of experience. A piece of imaginative work of the same degree of complexity comes to be executed in less time and with less effort. Thus the child of twelve follows a book of travel or an historical narrative with greater facility than one of six. Similarly, the advanced student of botany or zoölogy finds it easier to realize a description of a plant or animal than a tyro in the science. In the second place, this progress implies an increase in the difficulty of the operations which become possible. By more difficult operations must be understood either more complex combinations, such as the visualizing of a large and intricate scene, say a battle; or combinations more remote from our every-day experience, as the scenery and events of "Paradise Lost," or the life of primitive races.

Varieties of Imaginative Power.—Different persons differ in power of imagination no less markedly perhaps than in that of memory. These differences may be either general or special. One boy will display superior constructive ability generally. More commonly, excellence in imaginative capability shows itself in some special direction. Thus, we have a good imagination for visible objects, for musical combinations, for practical expedients, and so forth. And as a more circumscribed development we find a specially good power of imagining natural scenery, faces, or historical incidents.

These differences plainly depend partly on native inequalities and partly on differences in surroundings, the influence of companionship, and special exercise and training. Children differ from the first in their formative power as a whole. Some minds are able to readily recast the various results of their experience, while others find it hard to break up the mental connections forged by experience. Again, we commonly observe a special bent to one kind of imaginative activity, which is the outcome of a specially good sense, with its accompanying superior degree of retentiveness. In this way the born painter, with his fine eye and his good memory for color, would naturally find it easy to exercise his imagination on this material. Not only so, the emotional susceptibilities and the special interests of the individual have much to do with fixing the special line of development of the imagination. A naturally strong liking for scientific observation and discovery leads a boy to exercise his imagination in relation to natural phenomena and their laws, whereas a deep feeling for the beautiful aspect of things would impel the imagination to follow the line of artistic or poetic combination.

While in this way much of the difference, with respect both to the general and to the special development of imaginative power, is predetermined by natural aptitude and inclination, the influence of surroundings and of education is a considerable one. Systematic training will never make a naturally unimaginative child quick to imagine, but it may materially improve the power, and even raise it to a respectable height in some special direction.

Training of the Imagination.—The notion that the educator has a special work to do in exercising and guiding the imagination of the young is a comparatively new one. The common supposition of the inutility, not to say the mischievous nature, of the faculty touched on above naturally led to the idea that if the educator had anything to do with the imagination of his pupils, it was solely by way of repressing its activity. It is to be hoped, however, that a clearer apprehension of the scope of imaginative activity, and the important part it plays in the operations of intellect, will turn teachers' attention more and more to the problem of helping to develop the faculty in a healthy and worthy form.

As has been pointed out above, the imagination, in the unregulated form of fancy, is a precocious faculty. Children often show a liveliness, a rapidity, and a daring in their fancies which astonish their elders. This precocity of the imaginative faculty points to the need of an educational discipline of it at an early stage of mental development. In truth, the work of training the imagination should begin and be carried to a certain stage in the child's home.

Twofold Direction of Imaginative Training.—The peculiar position of imagination, in relation to the intellect on one side and to the feelings and character on the other, gives rise to educational problems of peculiar complexity. The teacher must keep in mind the several aspects and functions of this mental power, if he would assign it its proper place in a scheme of mental training. Speaking broadly, we may say that the discipline of the imagination has a negative or prohibitory, and a positive or regulative side.

(a) Restraining Fancy.—It follows, from what was said above respecting the intellectual and moral dangers of an excessive indulgence of the imagination, that the faculty may need to be curbed and restrained. The educator must remember that, as Miss Edgeworth observes, imagination, like fire, "is a good servant, but a bad master." In the case of children the liveliness of their fancies, their ignorance and timidity, expose them to special risks from this source. The fact that children are apt to take all stories of fairy, giant, and so on as gospel imposes special obligations on the parent and teacher. Their minds may easily be overexcited by stories. Not only so, children are wont to believe in the reality of their dreams, and many a child has suffered much from haunting recollections of its nightmare fancies.* Every care must be taken to ward off and dispel dismal fancies. And, further, a too decided bent to imaginative indulgence, to building castles in the air, and to reverie, should be corrected by calling forth the faculties of the child's mind in grappling with real facts, and in attractive and useful kinds of activity.

In thus repressing childish fancy, however, much discrimination and judgment is needed. Educators have been wont, perhaps, to overestimate the evils of children's flights of fancy. The imaginative creation of a glorious realm of fairy-land is natural and appropriate to childhood. It is the source of much pure delight, and the fond delusion tends, in ordinary cases, to disappear with so little suffering that its harmful effects become evanescent. It is only in special cases, where there is a specially lively fancy and a too tenacious hold on the imaginary world, with a corresponding want of interest in adjacent reali-

* Beneke tells us that both Erhard and Kasper Hauser, when children, believed in the reality of their dreams.

ties, that a decided interference by the educator is called for.[23]

(b) Cultivating the Imagination.—While the educator has thus to check and limit the activity of youthful fancy in certain directions, he has also an important function to discharge in aiding to develop the faculty. He should remember that the playful activity of the fancy at this early period is valuable as a preparation for the serious intellectual work of later years. Just as the infant's plump unformed hand, by its seemingly idle and purposeless manipulations of whatever comes within reach, is acquiring strength and precision of movement for the labors of after-life, so the imagination develops into a strong and flexible organ by what are apt to seem to older people foolish indulgences. The parent should not be too anxious to check even the vagaries of childish imagination. To a large extent these may be left to correct themselves. So long as these sportive flights of fancy direct themselves to what is wonderful, beautiful, or merely grotesque, and steer clear of the sensational and horrible, they are not likely to do much mischief either to the intellect or to the character.

But the parent should not leave the child's fancy altogether to follow its own wayward will, but should seek to aid in developing and guiding it into healthy channels of activity by supplying appropriate objects. The habitual narration of stories, description of places, and so on, is an essential ingredient in the early education of the home. The child that has been well drilled there in following stories and descriptions, will, other things being equal, be the better learner at school. Such exercises train the young mind in fixing the attention and in taming the fancy, compelling it to move within prescribed lines laid down by another. The early nurture of imagination by means of good wholesome food has had much to do with determining the degree of imaginative power, and, through this, of the range of intellectual activity ultimately reached.[24]

In order to train the imagination wisely, we must attend to the natural laws of its operation. Thus it is obvious that the first constructive tasks imposed should be simple, and so adapted to the limited experiences of the child. The first condition of success in every attempt to call the child's imagination into play is to make sure that he has the necessary stock of experiences out of which the picture has to be constructed. Such experiences are needed not only to supply the elements or details of the mental picture, but also to provide analogies which may serve as a rough model for the composition. Thus, to take a simple example, a child will be aided to form a mental picture of a snow mountain not only by recalling the mountain form and the white snow, but also by referring to some familiar object which shall serve as a prototype of the whole, say a loaf of sugar.

The second main condition of success is to awaken a lively interest or motive. The materials provided for constructive activity, the scene described, or the action narrated, must be interesting and attractive to the child, as well as within his grasp. The child's feelings must be appealed to by the pretty, amusing, pathetic, or noble aspect of the theme. It is only when the feelings are thus gently stirred that the imagination is lively. At the same time the emotional effect must not be allowed to become strong and violent, so as to interfere with distinctness of imagination and a full impartial grasp of all the elements of the description. This shows that in training the imagination we need to study the emotional side of child-nature and its many individual varieties.

Once more, the imagination, like every other faculty, must be called into play gradually. Not only should the conservative operation be adapted to the growing experience of the child, and the natural order of unfolding of his feelings, it must be suited to the degree of imaginative power already attained. Thus descriptions and narrations should increase in length and intricacy by gradual steps. The first exercises of the imagination should be by means of short, telling narrations of interesting incidents in animal and child life. Such stories deal in experiences which are thoroughly intelligible and interesting to the child. The best of the traditional stories, as that of Cinderella, are well fitted by their simplicity as well as by their romantic and adventurous character to please and engross the imagination. And fables in which the moral element is not made too prominent and depressing, and in which the child's characteristic feelings, e. g., his love of fun, are allowed a certain scope, will commonly be reckoned among his favorites. As the feeling of curiosity unfolds, and the imaginative faculty gains strength by exercise, more elaborate and less exciting stories may be introduced.

It is to be feared that a good deal of so-called children's literature offends by inattention to these obvious conditions of success. It is not needful to speak of the "nightmare" and strongly sensational stories which injure children's minds by disposing them to dwell in a morbid way on images of the terrible, and vitiate the taste by begetting a craving for sensational excitement. For, though examples of such pernicious child's literature might be found in classical collections of fairy-tales, the judicious parent may be trusted to guard his children from injury in this direction. Nor need one refer to the patently didactic and "goody" stories which commonly weary children—when they succeed in engaging any measure of their attention at all. For these seem to be rapidly growing old-fashioned. It is more important to call attention to a besetting fault in recent children's literature, viz., that of describing experiences, situations, impressions and feelings quite out of their mental reach. The writers of children's books but too rarely have the art of looking at the world with the eyes of a young person. It is no doubt true that children's literature has of late greatly improved in point of naturalness, brightness, picturesqueness, and other good qualities; still, this vice of writing over children's heads is a serious drawback to its educational value.

Exercise of the Imagination in Teaching.—The main proposition emphasized in this chapter is that the imagination is necessarily exercised in the work of instructing the child in the knowledge of the realities which surround him. This is apparent in the beginnings of teaching. The intelligent parent who talks to the child about the wonders of nature, the formation of clouds and rain, the movements of the earth and the stars, the flow of sap in the plant, and the ways of animals, is continually calling forth the learner's imaginative powers. And all verbal instruction in the facts of human experience, the lives of the great and good, the habits of different races of mankind, the history of the nations, and so forth, opens up another wide and attractive arena for the exercise of the imagination. There is a special value in thus training the imagination in connection with the process of acquiring real knowledge. The necessity of grasping and understanding realities disciplines the fleet-winged faculty to a certain sobriety of movement, and thus fits it to be the useful ally of the understanding.

As we have seen, the imagination is called into activity in all branches of teaching. In some branches, as history and geography, it is more especially exercised. Here, then, a knowledge of the laws of operation of the faculty will be a matter of great importance to the teacher.

Here, too, the first thing to attend to is to take care to call up the needed past impressions in a vivid and distinct form. This end will be secured to some extent by a wise selection of words. These must, so far as possible, be simple and homely, so that they may call up the images at once. More than this, the teacher should remind the child of facts in his experience, the recollection of which may contribute to the production of a distinct idea of the place, scene, or event. Thus, in describing an historical event, the several features must be made clear by parallel facts in the child's small world, and so the whole scene made distinct by the help of analogies. This requires a good deal of knowledge of child-life and much skill in searching out analogies. In thus utilizing the child's own experiences, however, the teacher must be careful to help the child to distinguish the new from the old, and not to import into the new image the accidental and irrelevant accessories of his experience.

Once more, the teacher must seek to follow the natural order in exercising the imagination. He should remember that all knowledge proceeds from the vague and indefinite to the definite and exact, that clear ideas are formed by a gradual process of development. There is first a dim outline, a blurred scheme, and this gradually grows distinct by additions of detailed features. Thus the description of a country best begins with a rough outline of its contour, its surroundings, and its larger features, as mountain-chains, etc. Similarly, historical narrative, say that of a particular reign in English history, best sets out with a recital of the leading events, which may serve as a rough scheme or outline of the whole, into which the details may be fitted. There is an orderly procedure in description which is needed by the imagination as much as by the understanding. A sudden plunge into details, and a disconnected enumeration of these, are fatal to an orderly construction.

Again, in successively unfolding the different parts of such a complex subject as the history or geography of a country, that order should be followed which is most favorable to imaginative activity. Thus the progress should be, so far as possible, from the known to the unknown. In geography, for example, the teacher, after a brief elementary account of the earth, starts with the child's own country and locality, and so passes gradually to more distant parts of the globe, where the natural features and the human life are strange, and therefore difficult to realize. Also, what is relatively simple and interesting should precede more complex and difficult matter. Thus, the first instruction in history should be quasi-biographical and a natural development of the early story, and the larger and more intricate study of the history of peoples, of the growth of constitutions, and so forth, reserved for a later stage of development.* Similarly, in teaching geography, the human interest should at first be made prominent by connecting description with a narration of some real or imaginary journey, with its adventures, dangers, etc.

Finally, in all such teaching by way of verbal description, the imagination of the learner should be assisted by a judicious use of actual sense-impressions. The important aid rendered to the child's imagination by globes and models, and, in a less degree, by maps of countries, is recognized in modern systems of instruction. The advantage derivable from these is due to the circumstance that the products of imagination are at best only a rough approximation, in respect of fullness and distinctness, to the actual perception of a thing. Moreover, description of places by means of language always has to encounter the obstacle that it can only present the parts of a locality or scene in succession, naming first one and then another; whereas the imagination requires to bring these together in one simultaneous view. The model or map lifts the mind above this difficulty by presenting the parts together

* In Mr. Fitch's valuable chapters on the teaching of geography and history (" Lectures on Teaching," chaps. xii and xiii) the reader may see a good illustration of the proper way to deal with the imaginative faculty.

side by side as we should actually see the localities themselves. Much the same applies to the aid rendered to the historical imagination by pictures and coins, and, better still, a visit to ancient buildings, like the Tower of London, museums of historical antiquities, etc.

While the teaching of these comparatively concrete subjects always involves the activity of the imagination in some measure, the teacher of them may appeal to the faculty in very various degrees. There is a picturesque way of describing a country, and of narrating an incident in history, in which the chief aim of the instructor is to convey a lively picture of some scene or event. Here the wonderful, stirring, or touching aspects of the scene or event are emphasized; and, further, much attention is given to detail, so that the mind may have a full pictorial representation of the concrete whole. On the other hand, the special object of the lesson may be to exercise the learner in grasping and understanding the facts presented in their relation one to another, and to other facts. This would demand a more rigorous control of the feelings, a less full and vivid imagination of the details, and a certain simplification, so that the more essential features and the determining conditions may be readily seized by the learner's mind. To know just how far to excite the pictorial imagination of the learner, according to the nature of the subject and the special objects of the lesson, is one of the secrets of a skilled instructor.

Exercise of Invention.—As was pointed out above, the constructive process enters into many other mental operations besides those which we are accustomed to call the work of imagination. In finding out anything, in the practical application of knowledge in useful contrivance, and in artistic invention, the child is exercising his constructive powers. And one important part of education concerns itself with the development of this faculty of inventiveness.

Taken in this wide sense, the faculty of invention, or ingenuity in device, may be exercised in every department of life and study. Thus, in making known to the child the facts of nature and life, he should be invited to use his powers of bringing together what he already knows, in order to find out for himself, so far as he is able, what he desires to know. One important reason for not telling a child everything is that, by compelling him to find out for himself, the educator exercises and strengthens the discovery or inventive faculty. The more intellectual class of games, too, may be turned to good account as an exercise of inventiveness. The task of tracking the mental path through a labyrinth of suggestions to some particular idea of a person or thing by help of successive clews (as in the old-fashioned game of "How? When? and Where?") is a valuable exercise of the child's mind in those very processes of searching out the new by the light of the old, by which great scientific discoveries are made.

Mechanical contrivance and practical inventiveness in general are further developed to a certain extent by the spontaneous and playful activity of children. The educator must be careful not to interfere too much with the perfectly free and sportive character of the activity, for by so doing he would rob it of much of its charm and of its value. The full exercise of invention presupposes that the child is free to choose his own designs and plans. The domain of play must be respected, and only a general supervision of these self-prompted activities maintained. In the choice of toys it is important to select those which offer the greatest scope for contrivance. A toy is not something to look at and observe merely, but it must admit of being played with or done something with; and the more possibilities of various constructive activity a toy offers, the better it is as a toy. Jean Paul Richter says that the best toy of all is a heap of sand, along with which a box of bricks may be taken. As the child grows older his mechanical constructiveness should be called forth by useful occupations, such as gardening, carpentering, and so forth.*

The faculty of inventiveness should be encouraged to exercise itself in other directions too. The artistic and dramatic impulses should be utilized as motives to invention. A valuable part of the intellectual culture of the home is the directing of children's activities into such useful and refining exercises as planning out the garden-plot, adorning the room, inventing little dramatic spectacles, and so forth. A game like acting charades is an excellent means of calling into play the children's readiness and fertility in invention, that most useful capability of laying under contribution the store of acquisitions so as to arrive at some new result or produce some new effect.

The training of manual and artistic constructiveness is one of the chief objects aimed at in the Kindergarten exercises already spoken of. It must, however, be remembered that the directly controlled activity of the Kindergarten does not afford quite the same scope for development of individual inventiveness as play properly so called. Here all have to construct according to a definite external model. Such exercises serve the useful purpose of training the hand in dexterity, in combining movements, and developing the taste by presenting good models. In addition to this good result, ingenuity is called forth in a measure in discovering the proper way to reproduce the pattern. Not only so, all such imitative work may be made a means of ultimately developing the inventive faculty in the production of original design. The models supplied by the teacher give the child a standard by the aid of which he is the better fitted to strike out new plans. And this effect of the manual exercises of the

* The training of mechanical ingenuity by various manual employments is well illustrated by Miss Edgeworth. ("Practical Education," chap. i, p. 33, and following.)

school should be secured by the co-operation of the parent at home in encouraging the child to turn his attainments to fresh uses.

APPENDIX.

The characteristics of children's imagination are described by Perez, "First Three Years," chap. ix, and "L'Enfant de trois à sept ans," chaps. iii and iv. Cf. Pfisterer, "Pædagogische Psychologie," sec. 14.

The educational importance and the culture of the imagination are dealt with very fully by Isaac Taylor, "Home Education," chaps. ix and x ("Culture of the Conceptive Faculty"). Cf. Miss Edgeworth, "Practical Education," chaps. xxi and xxii ; Mdme. Necker, "L'Education," livre iii, chap. v, and livre vi, chaps. viii and ix ; Beneke, *op. cit.*, sects. 23 and 24 ; Waitz, *op. cit.*, sec. 10 ("Vom Spiele") ; Rosenkranz, "Pæd. as System," p. 42, etc.

In connection with the training of the imagination, the student would do well to study the principles of the art of description as set forth in Prof. Bain's "English Composition and Rhetoric."

CHAPTER XII.

ABSTRACTION AND CONCEPTION.

Apprehension and Comprehension.—The intellectual operations hitherto considered have had to do with individual things. To perceive, remember, and imagine have reference to some particular object, as the river Thames, or a particular occurrence, as the opening of the new law-courts. But we may reflect and reason about rivers or ceremonies in general. When we do so we are said to *think*. In thinking we are concerned not with single objects with all their individual peculiarities, e. g., this oak-tree, with its particular size, twisted shape, etc., but with certain qualities of these objects common to these and many others, e. g., the general characters of oaks or of trees. In other words, when we think our minds are occupied about the qualities of things, their relations one to another, and the general classes into which they naturally fall.

Thinking is closely related to understanding, and indeed the two words are often used to mark off the same region of intellectual operation. When we view an object as a concrete whole, we *apprehend* it; when, however, we regard it under some aspect common to it and other things, we *comprehend* it. Thus the child apprehends this particular building, that is to say as an individual thing distinct from surrounding things, having a particular shape, size, etc.; he comprehends it when he recognizes it as one of a class of things, as buildings or products of human labor. To understand things is thus to assimilate them to, or to class them with, other things.

Stages of Thinking.—It is common to distinguish three stages of thinking. First of all, there is the formation of general ideas, general notions, or concepts, which may be said to constitute the elements of thought, such as "material body," "weight." This is called conception. Next to this comes the combining of two concepts in the form of a statement or proposition, as when we say "material bodies have weight." This is termed an act of judging. Lastly, we have the operation by which the mind passes from certain judgments (or statements) to certain other judgments, as when from the assertions "material substances have weight," "gases are material substances," we proceed to the further assertion "gases have weight." This process is described as reasoning, or drawing an inference or conclusion.

The General Notion or Concept.—A general idea or concept is the idea in our minds answering to a general name, as soldier, man, animal. When we use these terms we do not form complete pictures of individuals with their several peculiarities. Thus the term soldier does not call up the full impression of some one individual that we happen to know, with his proper height, style of uniform, etc. Still less when we use the name animal are we distinctly imagining some particular individual, as our dog Carlo or the elephant Jumbo. The general idea or notion is thus not a pictorial representation of a concrete thing, but a general abstract representation of those qualities which are common to a number of things.

At the same time, it is obvious that there is a close connection between a concept and the corresponding image. If, for example, we had never seen or heard a description of individual soldiers, we could not form the general idea, or think of the class, soldier. More than this, if we could not at the moment of using a general name recall particular examples with some degree of distinctness, the name would be devoid of meaning for us. In thinking of any general class, as a plant, our minds are representing individuals, only in a comprehensive and abstract way. That is to say, we have the power of putting out of sight for the moment their individual peculiarities, and of fixing the attention on their common or general qualities. Thus, in thinking of "tree," we indistinctly recall the elm, oak, and so on; but what we specially bring into view is the common features of trees, arrangement of branches on a trunk, and leaves on the branches, etc.

How Concepts are formed.—From this slight account of the concept, we may see that it is fashioned out of percepts and images. It is the result of a process of elaboration carried out on the impressions supplied by concrete individual things.

In the case of the less general or abstract notions, such as gold, dog, oak-tree, this growth of general ideas is a comparatively passive process of assimilating the like to the like. A child forms an idea of horse, house, and so on, with very little mental effort. In the case of the more abstract notions, however, as metal, animal, or plant, there is involved a special activity of mind. It brings into exercise what is commonly called the faculty of abstraction. Hence the process of conception in this higher form is one of the later intellectual operations.

This operation of elaborating concrete impressions into concepts is commonly said to fall into three stages: (1) comparison, or comparing individuals one with another; (2) abstraction, or withdrawing the mind from individual differences and fixing it on common qualities; and (3) generalization, or the formation of the idea of a general class on the ground of these common qualities.

(A) Comparison.—By an act of comparison is meant the voluntary direction of attention to two or more objects at the same moment, or in immediate succession, with a view to discover their differences or their agreements. The objects may be both present together, and placed in juxtaposition, as when a teacher compares the handwriting of a child with the copy; or, as often happens, may be (either wholly or in part) represented, as when we recall a person's face in order to compare it with another which we are now observing.

As we saw above, a child in perceiving an object discriminates and assimilates. Thus, in recognizing a figure, as that of his father, he marks off the object in respect of height, etc., from other objects. In like manner, when he recognizes an object, as an orange, he assimilates it to other and previously seen objects. Yet here the differences and similarities are only implicitly seized, and not rendered explicit. The child does not distinctly recall other figures from which that of his father differs, nor does he distinctly recall other oranges which the present one resembles.

The explicit setting forth of differences and similarities takes place by means of comparison. In this we place the objects differing or agreeing in mental juxtaposition, so as to distinctly view them as related by way of similarity or dissimilarity. This act of comparison marks a certain development of intellectual power. An infant can distinguish and recognize a person, say its mother, but it can not compare one person with another.

This act of comparing two objects illustrates the highest kind of exercise of the power of voluntary concentration. The attention has to pass rapidly from one to the other, and grasp them together, so that their relation of dissimilarity or similarity may become apparent and well-defined.

Conditions of Comparison.—It is obvious that the act of comparison may be furthered by certain favorable conditions. Thus it is in general a distinct advantage to have the objects compared actually present to the senses. A child can compare two things, as brass and gold, or a butterfly and a moth, much better when he sees them both at the same time than when he has to recall what he has seen. Where it is necessary to compare something present with something absent, it is desirable to make the image of the latter as distinct as possible.

Again, it is very important to bring the objects into juxtaposition. Thus, in trying to see whether, and in what respects, the brass differs from the gold, the child should have them close together before his eyes. Or, if the objects compared are in their nature fleeting, as musical sounds, it is necessary to make them follow one another immediately.

Besides these external aids to comparison, there are certain internal conditions. The mind must be calm and free from all preoccupation, and must have the vigor and energy necessary to such a severe effort of attention. We may compare two things either on the side of their similarity or on that of their difference. Thus a child may fix his attention on the similarity in size between the moth and the butterfly, or on the difference between them. Which of the two shall specially engage his attention will depend on certain circumstances. Where two things are very unlike, and the resemblance between them relatively small and unimpressive, as the two metals gold and quicksilver, it is proportionately difficult to detect the latter. Again, some persons have a special aptitude and readiness in seeing similarities, others in seeing differences. And, lastly, a person may come specially prepared to see either likeness or unlikeness. Thus, if a child is asked how two objects resemble one another, he naturally looks out for the similarity between them.

We may now pass to the special form of comparison necessary to conception. Here, it is evident, the mind is on the lookout for likeness. In extricating the common qualities of iron, lead, and other metals, we are seeking to trace out or detect the similarities of things.

The conditions here are a number of objects brought together before the mind, either directly by way of the senses, or indirectly by means of the reproductive imagination. The objects being thus present, the mind is called upon to pass its attention from one to the other, with a view to detect the features or qualities which are manifested by all alike.

(B) Abstraction.—The next stage of the process of conception, which is closely connected with the first, is known as abstraction. This means the withdrawing of the attention from certain things, in order to fix it on others. It is thus a peculiar exercise of the analytic and selective function of attention. Thus a child that fixes its eye specially and exclusively on some feature of an object, as the brightness of a candle-flame, or the size of a large apple, is in a manner abstracting.* In its higher meaning, however, abstraction always involves the turning away of the mind by an exercise of will from what is attracting it at the moment. Thus the diligent student is displaying the power when he resolutely withdraws his thoughts from the sights and sounds of his surroundings and fixes them on some subject of internal reflection.

The way in which abstraction enters into conception is in the turning away the attention from the individual differences of the things compared. These are on the surface and striking, and so apt to engage the attention. Thus a child finds it hard to fix his attention on the common aspects of tin, lead, brass, etc., because of their impressive differences of brightness and color. Similarly, he finds it difficult to direct his mental eye to the common property in a variety of tools, as a gimlet, saw, hammer, etc. To resist the attractions of the individual diversities, and resolutely turn the attention in the direction of the

* See Perez, "First Three Years of Childhood," p. 189.

less potent aspect of their similarity, involves a severe effort of will. It is a manifestation of the highest power of voluntarily concentrating the attention in any direction desired.

(C) Generalization.—The third and final stage of the process of conception is generalization, or the formation of a class of objects. By discovering, for example, that lead, iron, gold, and so on, have certain properties in common, the child mentally places them together in a class, viz., metals.

In so doing, the child is generalizing. The class is in its nature general. It is not limited to the several objects examined, which are only particular specimens of the class. Nor in forming the class does the mind bring together and distinctly realize a definite number of things in a collection, as a class of children in a school. In creating a class, metal, the little discoverer need have no knowledge as to the number of things to be included in it. He has simply invented a new compartment, into which he is prepared to put whatever is found to have the necessary qualities.

Conception and Naming.—This process of forming concepts is completed by the act of naming the things classed. A name is a general sign or symbol which can stand for any one of an indefinite number of things. Without the aid of such a sign the mind could not arrange things in classes. We could form no idea of man or animal in general if we had not a common name to give the things.

The name has a twofold function and use in connection with abstraction and generalization: (1) It helps the mind to clearly mark off, define, and indicate the qualities that have been discovered by means of abstraction. Thus, by calling iron, lead, etc., "metal," we clearly separate out the common qualities and fix them in the mind for further use. (2) The name is the bond by which the mind ties together the several members of the class. In inventing the name we are providing ourselves with a general mark by which we can afterward recognize an object as a member of a particular class.

This double use of the name corresponds to the two functions which logicians attribute to names. These are known as (*a*) the denotation or extension of a term, and (*b*) its connotation or intension. The denotation refers to the things included in the class, and to which the name can be applied, as this, that, and the other piece of iron, lead, brass, etc. The connotation refers to the qualities signified by the name, and the possession of which is necessary to admission to the class or compartment, as hardness, metallic luster, etc.

From this account of the concept we can see what are its chief uses: (1) It helps us to retain our knowledge better, by allowing us to bring together many detached observations. Thus the child who has formed the notion of a class, metal, will thereby have gathered up into one comprehensive whole a number of separate and scattered percepts. (2) It is necessary to the orderly arrangement of our observations. By classing things we reduce their perplexing diversities to unity, and their intricate confusion to order. By the aid of our concepts we refer each object as it presents itself to its proper mental compartment, and so master and comprehend it. (3) It prepares the way for finding out the general laws that govern things, and so for explaining what we see.

In order that these ends be realized, it is necessary to connect our general notions with particulars, and our names with the things for which they stand. The concept is a name which stands for certain qualities in real objects, and which we are prepared to apply to any one of these when it presents itself. It ceases to have any meaning and value when the name is divorced from the things which it is intended to represent.

Discovering the Meaning of Words.—In this account of the formation of concepts we have supposed that the child brings objects together and compares them on his own account without any guidance from others. And this supposition answers to what actually takes place in certain cases. Children discover resemblances among things, and call them by the same name quite spontaneously and without any suggestion from others. At the same time, it is obvious that the greater part of their general ideas are formed (in part at least) by listening to others and noting the way in which they employ words. The process is in this case essentially the same as before. A child finds out the meaning of a word, such as "animal," "gentleman," and so forth, by comparing the different instances in which it is used, abstracting from the variable accompaniments, and fixing the attention on the common or essential circumstance.

Degrees of Abstraction.—Our less abstract concepts involve, as we have seen, but little active comparison. In arriving at the ideas of cat, house, and so on, the child finds no difficulty in turning away from differences. Resemblance here preponderates over difference, and the exercise of the power of abstraction is slight. It is only when he is called on to carry the process of abstraction further, and seek out more widely extended points of similarity, that a serious effort is required. Thus, in finding out what is common among dogs, horses, and other animals, houses, churches, and other buildings, the child needs to concentrate his mind closely, and turn away from many and striking differences. Speaking roughly, we may say that the wider the range of objects compared the smaller will be the amount of resemblance among them. And the more dissimilarity thus preponderates over similarity the greater will be the effort of abstraction required.

Marking off Single Qualities.—A higher exercise of abstraction is seen in the singling out for special consideration of some one of the common qualities of objects, as when we view a cannon-ball as round, heavy, and so forth. This stage of abstraction is represented by the use of adjectives or qualifying terms, supplemented by what logicians call abstract names, as weight, figure, etc. Here the process of breaking up or analyzing complex percepts is carried to a still further point. By inspecting and comparing things in this more abstract way our knowledge gains in exactness. Thus the child that can separately attend to the several qualities of water, as its fluidity, transparency, etc., has reduced his knowledge of the substance to a more distinct and precise form.

Varieties of Concepts.—The general ideas that we form are as various as the things we observe and the qualities they exhibit. Material objects present a number of distinct aspects or points of view, each of which may become the basis of a generalization. Thus we may bring together chairs, tables, and so on, under the head of furniture; or, looking at their material substance merely, we may class them as wooden things. An orange may be put into as many classes as it has qualities, as a round or spherical body, a colored body, a vegetable product, and so forth. Again, things may be classed in their bearing on our welfare, as useful or beneficial, and according to their beauty or picturesqueness.

In addition to material things, there are their several movements, as falling, rolling, hopping, etc.; their actions one on another, such as striking, bruising, breaking; the changes that bodies undergo, as expansion, contraction, growth, decay; and, further, the sequences of natural events, such as morning and noon, spring and summer. All these changes and occurrences present certain resemblances in the midst of differences, and our notions of them are reached by a process of abstraction.

Notions which involve Synthesis.—Many of our notions involve, in addition to the process of abstraction and analysis just illustrated, a process of putting together the results of abstraction in new combinations, or what is known as synthesis. This is illustrated in school studies, as history, in which the learner has to build up out of the results of observation and abstraction such notions as "Roman emperor," "feudal system," etc.

In many instances this process of synthesis is based on an operation of constructive imagination. By this the mind fashions a concrete image, which gives the peculiar form or structure to the concept. In this way a boy would build up an idea of a Roman consul, of a volcano, and so forth. In other cases, however, this basis of constructive imagination is wanting. Conception passes beyond the limits of distinct visual representation.

(A) Ideas of Magnitude and Number.—This process of transcending the limits of imagination is illustrated in the formation of ideas of all objects of great magnitude. Our notion of city, planet, or nation, the distance from the earth to the sun, and so forth, does not correspond to any object that we can distinctly see and picture. Such ideas are the vaguely realized results of a process of adding together or multiplying smaller and perceptible magnitudes, as a house, a ball, a crowd, a small distance.

This process is most clearly illustrated in the building up of the ideas of all the larger numbers. In the case of small numbers, as 3, 4, 5, we can distinctly perceive a difference in the aggregate of objects by the senses. A group of 3 objects looks different from one of 4. Hence, the first exercises in counting set out with concrete visible groups. Even in the case of these smaller numbers, however, a process of composition and decomposition (synthesis and analysis) is necessarily involved. A child only fully apprehends what 5 things are when he has taken the group apart, and can produce it by adding unit to unit. In the case of the larger numbers, such as 20, 50, 100, etc., this process of adding or summing makes up the whole meaning of the number. The numeral 100 does not correspond to a visual percept or an image. It stands as a symbol for the result of a process of summing or counting performed on units (or small groups of these) which are themselves sensible objects, and so picturable.

(B) Notions of Geometry, etc.—This synthetic activity is illustrated in a somewhat different way in the formation of the notions of geometry. Our idea of a mathematical line, a circle, and so forth, does not exactly answer to any observable form. No straight line, for instance, discoverable in any actual object, perfectly answers to the geometric definition. Even the most carefully drawn line would be found, on closer inspection, to deviate to some extent from the required type. It follows that these notions involve more than a simple process of abstraction, such as suffices, for example, for the detection of the quality color, or weight. They presuppose, in addition to this, a process of idealization. The student of geometry, in thinking about a perfectly straight line, has to frame a conception of an ideal limit, to which actual forms only roughly approximate. The notion thus represents, like that of a large number, the result of a prolonged mental process which surpasses the limits of distinct imagination. Hence, the peculiar difficulty which many a beginner at the science experiences in attaching any reality and meaning to these forms; and hence, too, the peculiar poetic charm of the science to many.

It is much the same with the notions smooth plane, perfect fluid, rigid body, etc., in physics. In framing these notions the student is called on to modify, perfect, or idealize the results of abstraction, to form ideal notions which transcend the limits of distinct imagination, and yet which are definite enough for the purposes of scientific reasoning. This constitutes one of the main difficulties of the science.

The distinction between notions answering to pictures and those which can not be reduced to images is related to the distinction drawn by logicians between symbolic and intuitive knowledge. We are said to have an intuitive knowledge of the number 3, or of the figure triangle, because we can picture them. But we have only a symbolic knowledge of the number 1,000, or of the figure chiliagon (one of a thousand sides). Leibnitz, who emphasized this difference, adds that intuitive knowledge is more perfect than symbolic. This illustrates the importance of the function of imagination in relation to thought.

Moral Ideas: Idea of Self.—By a process of abstraction similar to that whereby the child learns to group external objects according to their resemblances, he comes to a knowledge of the inner and moral world, his own mind and character. His idea of self begins with the perception of his own organism, as the object in which he localizes his various feelings of pleasure and pain. Even this partial idea is slowly acquired. As Prof. Preyer points out, the infant does not at first know his own organism as something related to his feelings of pleasure and pain. When more than a year old his boy bit his own arm just as though it had been a foreign object.* This crude and material form of self-consciousness seems to correspond to the early period of life, in which the child speaks of himself by his proper name.

As the power of abstraction grows, this idea of self becomes fuller, and includes the representation of internal mental states. The child does not at first reflect or turn his attention inward on his own feelings. He is glad or sorrowful, but as soon as the momentary feeling is over he is apt to forget all about it. His attention is absorbed in outward things. To attend to the facts of the inner life implies an effort, an active withdrawal of the mind from the outer world. This only occurs later on, and first of all in connection with the development of certain feelings, as love of approbation, pride in displaying his prowess, etc.

* "Die Seele des Kindes," p. 360.

The influence of others is an important factor in the growth of this fuller idea of self. More particularly its development would be promoted by the experience of moral discipline and the reception of blame or praise. It is when the child's attention is driven inward, in an act of reflection on his own actions as springing from good or bad motives, that he wakes up to a fuller consciousness of self. The gradual substitution for the proper name of "me," "I," "my," which is observable in the third year, probably marks the date of a more distinct reflection on internal feelings, and consequently of a clearer idea of self as a conscious moral being.

A further process of abstraction is implied in arriving at the idea of a *permanent* self, now the recipient of impressions from without, now the subject of feelings of pleasure and pain, hopes and fears, and now the cause of outward actions. The image of the enduring and always present object, the bodily self, undoubtedly contributes an important element to this idea. But this supplies only the more concrete or pictorial part of the representation. The assurance of an enduring mental self, one and the same through all the changes of feeling, involves a certain development of the child's memory, and the power of realizing that he has had a past and a continuous history.

The highest outcome of this process of abstract reflection is the knowledge of self as having definite capabilities, intellectual and moral. Such an abstract idea of self presupposes many comparisons of states of mind, feelings, actions, etc. Thus a child builds up his idea of himself as susceptible to pain, as able to understand, to obey, etc., by bringing together many of his past experiences, and seeing what is common to these.[25]

Notions of Others.—In close connection with this development of self-knowledge there grows up the knowledge of other conscious beings. It is probable that the child is instinctively disposed to endow with consciousness any external object which resembles himself in any way, and more particularly in the power of self-movement. But this personification of things is checked by the growth of knowledge and discriminative power. The child learns now to distinguish between inanimate and animate objects, and between the several grades of the latter. When this stage is reached, he is in a position to form more accurate ideas respecting other human beings.

The knowledge of self and of others reacts one on the other. The child is only able to think of others, e. g., his mother or brother, as conscious beings, by endowing them with feelings analogous to what he has observed in himself. On the other hand, the observation of others materially aids in the development of a fuller and more accurate knowledge of self. Thus, by seeing what another child can do by trying, he learns more of his own powers; by witnessing new forms of suffering, he imaginatively realizes more of his own capacity to suffer, and so forth.

By comparing different actions of the same person and actions of different persons, the child learns to group them in classes, as kind, wise, good people; and in this way his ideas of others grow more distinct. By a higher exercise of the power of abstraction he is now able to mentally place each individual of his acquaintance in some definite compartment or category, according to the particular qualities which he displays.

Conception and Discrimination.—The formation of concepts involves, as its main factor, the function of assimilation in its higher form of detecting resemblances in the midst of differences. At the same time, the other great intellectual function, discrimination, is also exercised in the process. In classing things, the mind always refers more or less explicitly to differences. In forming the concept animal, for example, we are not only connecting many unlike things on the ground of their resemblances (animal structure and functions), but are marking these off from other things lacking these points of similarity (plants and inanimate objects). When we think of European we are tacitly referring to non-Europeans (Asiatics, etc.). Indeed, we can not constitute a class by the presence of certain marks without at the same time drawing a line about it or limiting it, and so implicitly distinguishing it from other things wanting these marks. In all cases where there are well-marked contraries or opposites, as heavy—light, sweet—bitter, good—bad, and so on, this process of discrimination becomes more explicit. To bring an object under tne class of light bodies is to set it over against the class of heavy ones.

Classification.—The orderly, systematic review of the agreements and the differences among things leads to what is called classification. To classify things is to view them in such a way that their different degrees of resemblance and difference may be clearly exhibited. This takes place by proceeding through a series of gradations from notions of a low degree of generality to those of a higher degree. Thus, supposing we have the concepts "plow," "spade," and so forth, we may group them under a more general head, "agricultural implements." With these we may take other things, such as carpenters' "tools," "surgical instruments," "machines," etc., and bring them under a still more general head, "instruments of labor." Any lower class is called, in relation to the higher class under which it is brought, a species; and the higher class is called, in relation to the lower, a genus. In each step of this process we are *co-ordinating*, or placing side by side, certain lower classes or species, marked off from one another by particular qualities (e. g., surgical and agricultural use), and *subordinating* them under a larger class or genus.

In this upward movement of thought from smaller to larger classes, or species to genera, we continually discard differences (e. g., surgical, agricultural use) and bring into view a wider similarity (e. g., quality of being an aid to labor of some sort). But we may set out with a large class, and by a downward movement break it up into successively smaller classes. For instance, given the class plane figure, we may break it up into rectilinear and curvilinear; each of these classes, again, may be further broken up into sub-varieties. Thus the rectilinear figures may be separated into three-sided figures, four-sided, and so on. This downward movement from the general to the particular is known as division. It proceeds not by a gradual elimination of differences, but by a gradual addition of them by a process of qualification, or what is called by logicians "determination." Thus the notion figure is further determined by the addition of the qualification rectilinear; this again by the addition of three-sided, and so on. In this way the differences among things, as well as their resemblances, are clearly brought into view.[26]

The most elaborate examples of this orderly arrangement of things is seen in the classifications of natural history, mineralogy, zoölogy, and botany. But any general notion may thus be connected with other cognate or allied notions, and so the germ of a classification obtained. In this way we bring together the classes house, church, etc., under the genus building; or, to illustrate the reverse process, we divide the class book into sub-classes according to its purpose (amusing, instructive) or size (octavo, etc.). Even the notions corresponding to abstract names admit of this orderly treatment. For example, we can classify the several sorts of color, movement, human action, virtue, and so forth. By thus arranging things in a systematic way, and so bringing into light their similarities and their differences, we prepare the way for a systematic inquiry into their unknown properties and the laws that govern them.

CHAPTER XIII.

ABSTRACTION AND CONCEPTION (*continued*).

In the preceding chapter we examined into the nature of the process of abstraction and its results in what is known as the concept. In the present chapter we shall consider the natural defects of our notions, and the best way to correct them.

Imperfection and Perfection of Notions.—Our every-day notions are apt to be defective in a number of ways. It is easier for the mind to become indistinct in its notions than in its percepts or its images. This special liability of concepts to grow indistinct is connected with the very nature of the conceptual process, and with the fact that its results are embodied in language. It is possible to use words for every-day purposes with only a very rough notion of their purport. Many of the operations of reasoning can be carried on with only a momentary glance at the meaning of the terms employed. Hence the wide opening for vague concepts.

Distinctness of Concepts.—By a distinct, clear, or well-defined concept is meant one in which the several features or characters of the objects thought about are distinctly represented. Thus a boy has a distinct idea of coal when he clearly distinguishes and grasps together as a whole its several qualities, as its black color, its frangibility, combustibility, etc. On the other hand, an idea is indistinct, hazy, or ill-defined when the constituent qualities of the objects are not thus distinctly represented.

Closely connected with the distinctness of a concept, as just defined, is its distinctness with respect to other concepts. By this is meant that the idea is carefully distinguished from other and partially similar concepts. Thus we have a distinct idea of a nut when we distinguish the group of characters constituting it from those of an ordinary fruit; of a planet, when we distinguish the characters from those of a fixed star, etc. On the other hand, a concept is indistinct when it is apt to be confused with a kindred concept. Thus a boy studying history has confused notions when he does not discriminate an aggressive from a defensive war, a limited from an absolute monarchy, and so forth.

We can best test the distinctness of a concept by our facility in applying the name or recognizing a member of the class when it presents itself. In general all want of distinctness, whether of the first or second kind, must tend to interfere with a prompt and accurate naming of objects. Want of distinctness in the connotation leads to want of certainty with respect to the denotation. At the same time, we are often able to name things readily when our concepts are far from being perfectly distinct. Thus an ordinary child will at once recognize a fruit, and yet be unable perhaps to say what the constituent fruit-marks are. This suggests that a concept may be distinct in the second sense without being so *in the same degree* in the first. The cluster of marks is represented with sufficient distinctness for keeping the name apart from other names, and for applying it roughly to the objects we meet with; but there is no careful analysis of these characters.

Causes of Indistinctness of Concepts.—The imperfections just spoken of may arise from either of the causes stated above. Many notions are indistinct from the first because the percepts and images are so, or because the process of abstraction has never been carried far enough to bring into distinct relief the common characters of a class of things. This last remark applies with special force to the notions of the young and uneducated, who can in most cases distinguish the more familiar classes of objects, such as oak, tree, church, and so on, but who have not carefully reflected on the contents of their notions.

But, again, our notions are apt to become indistinct (in both senses) from the lapse of time and the imperfections of memory. The concept grows out of images of real things, and if our images fade from memory our notions necessarily grow hazy. A boy that is always forgetting the concrete illustrations of class-names, as water-shed, Roman consul, transitive verb, and so on, is sure to lapse into vague ideas of these classes.

Finally, there are certain features of language which promote indistinctness, especially in early life. The fact that the child is hearing a highly developed language spoken about him, which embodies the finer distinctions of mature intelligence, must tend to bewilder his mind at first. He finds it hard to distinguish between closely related and overlapping words, "healthy" and "strong," "sensible" and "clever," and so forth. And then there is a more serious source of perplexity of an opposite kind, viz., that arising from the imperfections of language, and more particularly the ambiguities of words. Such ambiguities, by hiding a variety of meanings under one word (e. g., pretty, as nice-looking and as moderately), tend to baffle the child in trying to discriminate one idea from another. This mischief is of course greater where words are used loosely by others. A mother, for example, that does not distinguish between mere inadvertence and culpable carelessness, and the teacher that is apt in his impatience to call mere ignorance and intellectual slovenliness by the same name, adds seriously to the difficulties of the young student of language.

Accuracy of Concepts.—We have to distinguish between the mere indistinctness of a concept and its positive inaccuracy. A distinct notion depends on our clearly representing the marks we take up into our notion: an accurate notion depends on our taking up the right elements, i. e., the common characters of the class, and no others. Or, to express the same thing in different language, an accurate concept is such that the name in which it is embodied will cover all the things commonly denoted by that name, and no others.

Inaccuracy of conception, like mere indistinctness, may arise either through an imperfect performance of the initial processes of comparison and abstraction, including the discrimination of one group of things from another, or through a subsequent process of decay or disintegration of the concept.

(A) Inaccurate Notions depending on Imperfect Abstraction.—To begin with, then, a notion may be inaccurate because the process of abstraction or notion-formation is incomplete. The first notions of all of us are loose and inexact, answering to a rough and hasty process of inspecting the objects. Owing to these imperfections, the notions are inaccurate; that is to say, the range of the name is not co-extensive with that of the things commonly or properly denoted by it. In this way our class, or the denotation of our name, becomes too narrow or too wide.

In the first place, a notion may be formed on too narrow an observation of things, the consequence of which is that accidental features not shared in by all members of the class are taken up into the meaning of the word as a part of its essential import. For example, a child that has only seen red roses is apt to regard redness as a part of the meaning of rose; and one whose knowledge of metals includes only the more familiar examples, iron, etc., naturally includes hardness and solidity in his idea of the class, which would thus exclude quicksilver. We are all apt to take up into our notions the accidental associations of our individual experience, the place and time in which we live. Thus man to an English child includes the notion of a white skin, government that of a sovereign, and so on. Such notions are too narrow.

In the second place, a notion may be inaccurate by giving the class too wide an extent. If the mind's observation of things is superficial and hasty, only a part of the common traits or marks, viz., those which are conspicuous and impressive, are embodied in the name. The notions of children and of the uneducated are apt to be too wide. They pick up a part, but only a part, of the significance of the words they hear employed. Thus they observe among different creatures called "fish" the conspicuous circumstance that they live in the water; and so they make this the whole meaning of the word, and are ready to call a porpoise or a seal a fish. In a similar way a child will call all meals "tea," overlooking the fact that "tea" is a more special name than "meal," pointing to a particular hour of the day.

(B) Inaccurate Notions depending on Loss of Elements.—While notions may thus be inaccurate at the outset, owing to defective observation, they tend still further to become so by the lapse of time and the gradual obliteration of some of their elements. Every successive loss of such elements involves a growing divergence between the name and the things denoted. In other words, the concept grows too wide. As names are emptied of their full significance they thus become too inclusive. Thus a child that forgets that "unkind" implies an intention to hurt another will call its playmates or its mother unkind where there has been no such intention. The converse error, too, of allowing accidental accompaniments to insinuate themselves into, and blend with, the notion, is not uncommon. Thus, as Waitz observes, a boy, after having been taught that the size of an angle is independent of the length of the lines that form or inclose it, easily lapses into the error of embodying this accidental element in his notion of angular magnitude.

It is only necessary to remind the reader that indistinctness of conception is closely related, and commonly leads on, to inaccuracy. Where our ideas of things are hazy, there is a peculiar danger of dropping essential elements and of taking up accidental ones, and so of making our classes too wide or too narrow. Not only so, such indistinctness is highly favorable to confusing ideas one with another and substituting for the proper meaning of a term that of some kindred term.

On Revising our Notions.—It follows from the above that the formation of a perfect concept includes not one process of comparison and abstraction only, but a succession of such processes, by the aid of which the first rough draughts of our ideas are improved, and also the tendencies in words to lose their significance counteracted. Defective conception at the outset can only be made good by more searching inspection of the things submitted to examination, and also by a wider and more varied observation of objects in their similarities and dissimilarities.

Not only so, even when the concepts have been properly formed, they can only be kept distinct, and consequently accurate, by going back again and again to the concrete objects out of which they have in a manner been extracted. Only when we do this shall we avoid the error of taking empty names for realities, and keep our representations fresh and vivid. If the educator wants to avoid that divorce of words from things against which Comenius protested, he must continually revivify the notions of his pupils by reverting to concrete illustrations.

Relation of Conception to Imagination.—The above remarks help to bring out still more distinctly the relation between imagination and thought. As we have seen, a notion differs from an image in that it contains a representation of common features only, and not of individual peculiarities. When words tend strongly to call up images of particular concrete objects, the processes of thought are obstructed. The highly imaginative mind which instantly reduces a word to some concrete instance is heavily handicapped in following out trains of abstract thought.* The many interesting accompaniments of the individual things interfere with the grasping of their general aspects.

At the same time, notions are formed *out of* images. Thinking is thus based on imagination (both reproductive and constructive). The meaning or content of a word is wholly derived from the inspection of concrete things. Hence, a notion, in order to have substance in it and to be well-defined in shape, must be continually supported by images. In order to think clearly, a child must be able to imagine distinctly, to call up as occasion requires individual members of the class.

On Defining Notions.—Our notions are rendered distinct and accurate not merely by going back to concrete facts or examples, but by a number of supplementary processes, which may be grouped under the head of definition. To define a word in the logical sense is to unfold its connotation, to enumerate more or less completely the several characters or attributes which make up its meaning. As we have seen, we form many concepts, such as "metal," "man," "civilized country," before we are able to represent distinctly the several attributes included in the connotation of words. It is only when the mind's power of abstraction increases that this higher stage of

* This is, of course, generally the case with the young and the uneducated. The narrowness of their experience, and the feebleness of their powers of abstraction, cause words to be pictorial, descriptive of concrete individuals rather than symbolically representative of classes. This tendency is amusingly illustrated by Mr. Galton. Some one began narrating, "I am going to tell you about a boat." A young lady of an imaginative turn, being asked what the word "boat" called up, answered, "A rather large boat, pushing off from the shore, full of ladies and gentlemen." ("Inquiries into Human Faculty," p. 110.)

analysis becomes possible. When this has been carried out, the mind will be able to retain the essentials of the concept by means of the verbal definition. When, for example, the child has learned that glass is a transparent substance, composed of certain materials, brittle, easily fused by heat, a bad conductor of heat, and so on, the string of properties stored up by aid of the verbal memory will serve to give distinctness to the concept.

A second and subordinate part of this process of definition of names consists in the discrimination of the notion from other notions. The precise meaning of a word is only brought out by setting the notion over against its opposite or contrast, and by discriminating it from nearly allied notions. Thus, for example, the notion "wise" is elucidated by contrasting it with "foolish," and further by distinguishing it from allied notions, as "learned." Clear thinking implies a habit of distinguishing words and their meanings carefully one from another. Similarly, "rude" should be contrasted with "polite," and "distinguished" from "uncouth" or "awkward;" "brave" contrasted with "cowardly," and "discriminated" from "foolhardy."

Finally, our notions may be defined or rendered more sharp in outline by a reference to a classification of things. Logicians say that the best way to define a class name (especially when the qualities are too numerous, and many of them too imperfectly known, for us to enumerate them completely) is to name the higher class, or "genus," and add the "difference," that is, the leading features which mark off the class from co-ordinate classes. Thus we may define a parallelogram by saying that it is a four-sided figure (higher class), having its opposite sides parallel (difference). Such a definition serves to fix in the mind some of the more important marks of the objects, and to keep the concept distinct from other concepts (e. g., those of other four-sided figures).

Not only so, the practice of dividing a term, or pointing out the several smaller classes composing the class, serves to clear up or define our notions. Since a concept is formed by means of an inspection of things, an occasional reference to the whole extent of things covered by a name helps to give reality and body to the concept. Thus, in teaching a child the meaning of a term like metal, it is well to connect it in his mind with all the principal or more familiar varieties. In fact, the two processes here touched on, bringing out the connotation (logical "definition") and exposing the denotation (logical "division"), are mutually complementary.

Growth of Conceptual Power.—The power by which the mind frames general notions is merely an expansion of powers which show themselves in a rudimentary form in the earlier processes of perception. Thus the powers of comparison and of abstraction in its wide sense are developed, in connection with the process of perception itself, in carrying out those detailed operations of examining objects of sense on all sides which are involved in the formation of clear percepts. Again, the power of seizing similarity in the midst of diversity, which is the essential process in building up notions of classes and the qualities of things, manifests itself in a lower form in the first year of life. To recognize the mother's voice, for example, as one and the same through all the changes of loudness and softness and all the variations of pitch, or her figure through all the changes of light, distance, and position, clearly implies a certain rudimentary power of comparing unlike impressions and detecting likeness amid this unlikeness.

Early Notions.—The gradual development of the power of comparing objects and comprehending them in classes is one of the most interesting phases in the mental history of the individual. By a careful observation of children at the time when they begin to understand and use words, we may learn much as to the way in which this power spontaneously develops. More particularly, it is instructive to watch the way in which children about a year or fifteen months old invent names of their own, and spontaneously extend the words they learn from others to analogical cases.

As might be expected, the first notions which children form correspond to narrow classes of objects having a number of striking points of resemblances ; and, further, to those varieties of things which have a special interest for the young learners. Thus a child readily connects by one name particular varieties of food, as milk and pudding. In like manner he soon learns to assimilate certain classes of toy, as doll, picture-book, and other objects having well-marked resemblances, as hat and clock, etc. For the same reason, he at once extends terms, as "puss," "papa," which have first been applied to definite individuals, to other individuals, on the ground of numerous and prominent similarities.

Growth of Conception and of Discrimination.— It is to be noted that the child's concepts grow in clearness and definiteness with the power of noting differences as well as likenesses.* At first there seems to be no clear discrimination of classes from individuals. The name is used for a number of objects as seen to be alike, but, so far as we can see, without any clear apprehension whether they are the same thing or different things. This is probably true of the extension of the word "papa" to other men besides the father. The concept becomes definite just in proportion as differences are recognized and the images of individual objects, this and that person, this and that dog, and so on, acquire separateness in the mind. This same circumstance explains another fact, namely, that the child

* M. Perez says that children of about fifteen months, though eagerly on the lookout for resemblances, are very little so for differences. ("First Three Years of Childhood," p. 195.)

often uses the names of genera (if not too large classes) before those of species. Thus he lumps together animals resembling dogs, as goats, under the name "bow-wow." In like manner he will apply a word like "apple" to fruit generally, or a certain wide group of fruits, as "apple," "pear," "orange," etc. Similarly, he will understand in a rough way the meaning of the word "flower" before he comprehends the names "daisy" or "rose."

Formation of more Abstract Conceptions.—A higher step is taken when the child forms classes founded on a single property. The first examples of this higher power of abstraction have to do with aspects of objects of great interest to him. He first displays a considerable power of generalization in grouping together edible things. Mr. Darwin, in his interesting account of the early development of one of his children, tells us that when just a year old he invented the word "mum" to denote different kinds of food. He then went on to distinguish varieties of food by some qualifying adjunct. Thus sugar was "shu-mum." * Attention to common visual features comes later. A little boy known to the present writer, when in his eighteenth month, extended the word "ball" to bubbles which he noticed on the surface of a glass of beer. This implied the power of abstracting from color and size and attending to the globular form.

As experience widens and the power of abstraction strengthens, less conspicuous and more subtile points of agreement are seized. Children often perplex their elders with their use of words just because the latter can not seize the analogy between things or events which the young mind detects.† By degrees the young mind ad-

* See his article, "Biographical Sketch of an Infant," in "Mind," July, 1877 (vol. ii); *cf.* M. Taine's account of a little girl's first generalization of sweet things under the name "cola" (chocolate) in the same volume of "Mind," p. 256. See also M. Taine's work, "On Intelligence," vol. ii, book iv, chap. i, § i, par. ii.

† For example, a child of two and a half years, seeing a number of

vances to the formation of more abstract ideas. One of the earliest of these is that of disappearance, or the state of being absent, commonly expressed by the sign "ta-ta" or some similar expression.*

Use of Adjectives.—A distinct progress in the child's power of abstraction is seen when objects come to be qualified by the use of adjectives. A child will, from the first stage of speech, pick up and use a few adjectives, such as "hot" and "nice," which answer to simple sensations of very great interest to him. A more difficult achievement is seizing the meaning of a relative term, such as "big." The boy already referred to first employed this word when he was nearly twenty-two months old. Seeing a rook flying over his head, he called out, "Big bird."[27]

Among these more abstract conceptions reached in this early period of life, those of number and time deserve a passing notice. Prof. Preyer says that his boy in his twenty-sixth month had not the remotest idea of number. Another boy, already referred to, when twenty-two months old, distinguished one object from a plurality of objects, and this was long before he could distinguish two from three, and so on. He called any number of objects (besides one) "two, three, four," according to the formula taught him by his mother. When three and a half years old, the same child still confused number with size. Thus, on seeing beads of three sides, he called the smallest "four," the next "five," and the largest "six."† In like manner this

fowls perched in a row on a fence, said, "They are having tea." He had associated the idea of sitting in a row with sitting up at table.

* Prof. Preyer ("Die Seele des Kindes," p. 295) says his boy reached this notion of disappearance by the fifteenth month. The boy known to the writer certainly used the sound *ta-ta* or *ă ŏ* (all gone) for signifying the disappearance as well as the absence of a thing when he was sixteen months old.

† This answers to the fact that many savage races can not count above five, i. e., beyond the point at which differences of number are plainly apparent to the eye. The lower animals seem to have only the

child marked off all periods of the past under the head of "yesterday," and all periods of the future under the head of "to-morrow" or "by-and-by." A considerable advance in intelligence (including observation, etc.) is necessary before children can pass from this rough discrimination of one and many to the recognition of particular numbers, and from a mere discrimination between past and future to the recognition of definite divisions of time, as yesterday, to-morrow, last week, next week.

Period of Fuller Development.—The power of abstraction, of analyzing things and discovering their common aspects, qualities and relations, only attains its full development slowly. The denotation of names is learned long before a careful analysis of their connotation is carried out. This is seen plainly in the lateness of the comprehension and use of abstract names. As M. Perez observes, a child of two will perfectly understand the phrase, "This glass is larger than the stopper," but will not understand the expression, "The size of that house there."* The clear grasp of more abstract notions, including those of mental and moral qualities, belongs to the stage of youth as distinguished from that of childhood. The earlier period is pre-eminently that of concrete knowledge. During this time the number of concepts formed is comparatively small, and these are such as involve the presence of numerous or obvious resemblances. But from about the twelfth year a marked increase in the power of abstraction is commonly observable. In cases where the powers

most rudimentary perception of numbers. M. Perez ("The First Three Years of Childhood," p. 185, etc.) tells us that this corresponds to an animal's distinction of number. A cat with only one kitten left it out of a number was miserable; but when two were left it out of five it was contented. It thus distinguished between one and many. Sir John Lubbock lately remarked that if four eggs are in a nest, one may be taken without troubling the mother; but if two are removed, she commonly deserts the nest.

* *Ibid.*, p. 184.

of observation and of imagination have been properly cultivated we may notice at this stage a strong disposition to view things under their common aspects. And, conformably to this, the language employed becomes more general and more abstract.

How Progress in Conceptual Power is to be measured.—This advance may be measured in different ways. As the power of abstraction grows, particular impressions and observations are brought more and more under general heads. Again, it is noticeable that concepts on the same level of generality are framed with greater and greater facility. Less time and effort are needed to form a new notion. Once more, the concepts reached show a higher degree of generality and are more abstract in character. The use of such words as "action," "life," "idea," marks a considerable step onward. The progress of conceptual power is marked further by an increased distinctness in the concepts formed, and a greater facility in defining the terms used, and in distinguishing them from other terms with which they are apt to be confused.

Varieties of Conceptual Power.—Individuals differ considerably in their power of abstraction. Some minds are much quicker in seeing similarity amid diversity, in spying analogies among things, and in bringing to light the common aspects of objects. These differences turn partly on inequalities in power of attention, of drawing off the thoughts from what is attractive, and fixing them on what we desire to note. They depend too, in part, on inequalities in the mind's assimilative power. As already remarked, it is probable that some persons have a special bent of mind to the detection of similarity, whereas others lean to the perception of differences.

What is called a good power of abstraction shows itself in a general facility in detecting the common qualities and relations of things. At the same time, we commonly find the faculty manifesting itself in a special form in some particular domain of percepts and ideas. Thus one boy will show a special power of abstraction in classing natural objects, as minerals and plants; another, in analyzing physical processes; another, in constructing the ideal notions of mathematics; and another, in seizing types of human character and classes of motive.

These differences, again, clearly depend in part on native peculiarities. Children are not endowed at the outset with the same degree of assimilative power. A child at three years will often display a marked quickness in tracing out similarities in the forms of objects, manners of persons, and so forth. Moreover, the peculiar mental constitution and individual tastes may give a special bent to a definite form of conception. Thus, other things being equal, a boy with an eye closely observant of the forms of objects will show a special readiness in dealing with the concepts of geometry, while another with abundant muscular activity and a strong bent toward practical contrivance will naturally occupy himself in forming notions about Nature's processes, the notions with which mechanics specially deals.

At the same time, the degree of power of abstraction attained generally, or in any special direction, turns to a considerable extent on the amount of exercise, training, or culture undergone. Speaking roughly, we may say that the educated youth is most clearly marked off from the uneducated by the possession of a large stock of general notions and a facility in noting and detaching the common aspects of the things about him. And it is no less manifest that special devotion to any branch of study, as languages or mathematics, will in average cases result in a marked increase in a special conceptual aptitude in this particular region.

Training the Power of Abstraction.—The problem of exercising the power of abstraction and generalization is attended with peculiar difficulties. Children, it is commonly said, delight in the concrete, and find abstraction arduous and distasteful. Nevertheless, it is certain that they spontaneously occupy their minds in discovering resemblances among things and in the more simple kinds of generalization. There is, indeed, a real intellectual satisfaction in discovering similarities among things. A young child's face may be seen to brighten up on newly discovering some point of similarity.* And to some extent this pleasure may be utilized in calling forth and developing the child's powers. His lack of interest in generalities is often due to the fact that his mind is not supplied with the necessary concrete examples out of which the notions have to be formed.†

Exercise in Classing Objects.—The training of the conceptual power should begin in connection with sense-observation. As pointed out above, the analysis of objects into their constituent parts and qualities is the way in which the power of abstraction first displays itself And this exercise should be carried on hand in hand with the comparison of one object with another. In this way the first lessons in classifying objects and noting their abstract qualities should arise naturally out of the exercises involved in the training of the senses and the observing faculty. The impulses of activity should here be enlisted as far as possible in picking out and sorting objects, so as to lend a more vivid interest to the exercises.

The process of generalizing may be still further aided by a judicious selection of particulars for inspection. Here the teacher should remember that it is first impres-

* E. g., when a boy (twenty-six months old), watching a dog panting after a run, exclaimed with evident pleasure, " Dat like a puff puff" (locomotive).

† " There is nothing the human mind grasps with more delight than generalization or classification, when it has already made an accumulation of particulars; but nothing from which it turns with more repugnance in its previous state of inanition." (Isaac Taylor.)

sions which last, and that the examples of a class first studied serve to give the impress to the resulting notion. Hence, the examples first brought under the attention of the pupil should be such as most clearly exhibit the characteristic qualities of the class, and therefore best serve as the representatives of the same. Thus, to take an obvious example, in building up the class "food," common and familiar varieties, as milk, bread, etc., should be taken rather than exceptional varieties. So, in an elementary lesson on botany, good average specimens of a plant, showing the typical form, should be preferred to unusual or extreme examples. For a similar reason the best specimen of an island to take at the outset is one like Iceland, surrounded by a large mass of water, rather than one which, like Newfoundland or the Isle of Wight, has the striking accidental accompaniment of being a sort of appendage to a main-land. So, again, the teacher should be careful, in leading up to geometrical concepts, to make his representative instances typical. Thus the first triangle to present to the eye should not be an extreme form, as an isosceles triangle with a very narrow base, but one in which each of the three sides and angles is distinct and apparent.

It is well at the outset to reduce as far as possible by practical expedient the attractive force of individual peculiarities against which the faculty of abstraction has to work. This is effected, in geometrical teaching, by the device of separating form from its concrete embodiment, and more particularly the interesting concomitant of color. The drawing of a line or circle on the blackboard is an enormous aid to the formation of the abstract ideal notion of a perfect form separate from substance. The same device is available, to some extent, in dealing with the forms of concrete objects. Thus it is a great advantage to present the typical form (or forms) of the mountain by an outline drawing before going on to consider the individual specimens with their several irregularities and peculiarities. So, again, it is a great help, in building up the simpler notions of number, to begin with plain and not highly interesting objects, such as small pebbles, where the diverting influence of color and pleasurable association is reduced to a minimum.

Again, a sufficient variety of instances must be supplied in every case in order to avoid haste in comparison, and subsequent indistinctness and inaccuracy in conception. As Waitz observes, the learner must be led to see the whole extent of the abstraction, and be able to reproduce this if it is not to suffer in point of clearness and its applicability to single cases not to be indefinite. Nothing is more fatal than haste in slurring over the preliminary process of laying a broad and firm foundation of abstract conception in observation of concrete examples. No doubt a certain discretion may be observed here. The number of instances necessary to a clear concept is not the same in every case. As Dr. Bain remarks,* a child can be led to see a single quality, such as weight or transparency, by means of one or two well-chosen examples, whereas in the case of classes constituted by a number of connected properties, as metal, plant, etc., a large number are needful. Nevertheless, it may be safely maintained that teachers are in all cases apt to supply too few examples. Even the ideas of number can not be properly grasped without a variety of objects. The essential idea of number, as something independent of the particular local arrangement of the objects, can only be made clear by varying this—e. g., by presenting three as three dots or marbles in a line, as a triangular arrangement, and so on. Further, a child only fully seizes the *abstract* idea of three, four, etc., as distinct from three beads, and so forth, by comparing groups of different objects, as beads, trees, etc. The building up of the elementary ideas of number ought

* "Education as a Science," chap. vii, p. 197.

to be carried out in part under the parent's guidance in the observation of a large variety of every-day groups.

Once more, throughout this process of training the power of abstraction, the teacher should seek to combine the exercise of discrimination with that of assimilation. Thus he should invite the child to distinguish transparent from opaque bodies, solids from fluids, organic from inorganic bodies, triangles from quadrangles, and so forth; and the child should be trained in the systematic arrangement of classes by the processes of classification and division. In this way his concepts will grow in point of definiteness and orderly arrangement.

Finally, this operation of comparing and classing should be supplemented by naming the objects thus grouped together, and pointing out in the form of a definition the more important of the traits they have in common. This part of the process is attended with its own peculiar risks. Looseness in definition is not uncommon among parents and teachers. The rules of definition must be observed, essential and important qualities selected, and a sufficient enumeration of them given to enable the pupil to recognize members of the class. The test of a good definition is that it tells us as much as possible about the distinctive nature of the things denoted by the term, and so helps us to identify them. To secure this result it is not necessary to take the pupil at the outset into a survey of all the more obscure properties of things. Thus the term "metal" can be defined well enough for children's purposes without exhaustively setting forth all that the chemist understands by it; and, similarly, "plant," without bringing into view all that a botanist understands by the term. In thus using definitions, however, the teacher must be on his guard against a substitution of the verbal formula used in defining terms for a grasp of the real things themselves and their qualities. The definition must be based on, and grow out of, an actual inspection of things, and the vitality of the notion maintained by continual recurrence to concrete objects in the way of identifying them, picking them out from a crowd of objects, and so on.

The leading motto of modern education, "Things before names," makes it desirable to base all definition on a comparison of real objects. This truth is clearly recognized in teaching the elements of subjects that are commonly supposed to set out with definitions, as arithmetic, geometry, and physics. It is vain to plunge a boy into the definitions of Euclid till he has been exercised in building up ideas of the simpler geometrical forms by inspecting actual objects. And it is now coming to be recognized that the teaching of grammatical distinctions must follow the same rule. That is to say, the real meaning of a part of speech, or its function in a sentence, can be best arrived at by inspecting actual instances of spoken or written sentences and comparing a number of such one with another.

Explaining Meaning of Words.—A special difficulty in developing children's powers of abstraction arises in connection with the formation of those notions which can not be reached by a direct inspection of objects. All instruction involves the unfolding of the meaning of general terms. In the most elementary lesson in geography or history a certain number of such terms are necessarily employed. In moral instruction, new and difficult words have from time to time to be introduced and explained. The art of setting forth the meaning of a new term by well-chosen concrete example and in suitable language is one of the distinguishing marks of a good instructor. Where the child has had experience of concrete examples, as in the case of moral qualities, it is best to appeal directly in the first instance to this. Thus temperance, justice, and so forth, should be made real by reference to examples in the child's own life of the quality itself and of its opposite. But this should be supplemented by a reference to distinguished historical or literary examples, as the patriotism of Horatius, the bravery of Grace Darling, etc. And where, as in explaining many of the terms used in history, the instructor can not appeal to examples in the child's experience, the utmost use must be made of the analogies which that experience affords in order to secure the construction of clear typical images, and so of clear notions.[28]

Controlling the Child's Use of Words.—There is perhaps no part of intellectual training which requires so much careful attention as the control of the child's use of words. On the one hand it is an evil for a child to pick up and use words just because they are used by his elders and sound grand, before he can attach precise ideas to them. "When," says Madame Necker, "the want of a word has preceded the possession of it, the child can apply it naturally and justly." But as his intelligence and his needs grow, new words should be introduced and explained. As the same writer observes, "the power of expressing our thoughts helps to clear them up."

The educator should keep jealous watch over the child's use of words with the view of guarding him against a slovenly application of them. Looseness and vagueness at the outset are apt to induce a slovenly habit of thinking. This danger can only be averted by exercising the learner in making his notions as clear as possible. He should be well practiced from the first in explaining the words he employs. It is of great importance to see that a child never employs any word without attaching some intelligible meaning to it. He should be questioned as to his meaning, and prove himself able to give concrete instances or examples of the notion, and (where possible) to define his term, roughly at least. The meaning which he attaches to the word may be far from accurate, to begin with. But the educator may be satisfied with a rough approximation to accuracy as long as the meaning is definite and clear to the child's mind. As knowledge widens, the teacher should take pains to supplement and correct these first crude notions, substituting exact for rough and inexact definitions.

Order of taking up Abstract Studies.—The various subjects of instruction exercise the powers of abstraction in a very unequal degree, and so should be taken up at different times. The strength of faculty involved in the classification of natural objects is so slight that it may, as observed, be commenced in the age of observation in the nursery and Kindergarten. The exercise of abstraction in building up ideas of number belongs to a later period. Few children, I suspect, are ready for this till they reach their fourth or fifth year. And the same applies to the formation of elementary geometrical ideas. The careful classifications of natural history, as that of plants, presuppose a still higher power of comparing, assimilating, and discriminating things. A yet more decided leap is taken when we pass from these to the higher abstractions of physical science, as force, momentum, the more difficult mathematical conceptions, as sine of an angle, and the more abstruse ideas of history and morals, as state, representative government, justice, and so forth.*

The problem when it is possible and most advantageous to take up these more abstract subjects, is one of the most perplexing ones in the art of education. Individuals appear to differ so much in respect of the rapidity of this side of intellectual development that no universal rule can be laid down. One may, however, safely say that, in the past, teachers have been in the habit of taking pupils on to these higher exercises too soon, and it is probable that the pressure put on the modern teacher to get through a number of subjects in a short time leads to an injudi-

* One of the most difficult points to determine in the order of abstractness is the proper position of grammar, in its more logical aspects. See Bain, "Education as a Science;" p. 213.

cious, if not wasteful and positively injurious, introduction of abstract studies before the mind is fully prepared for them.

APPENDIX.

On the early developments of the powers of abstraction the reader should consult M. Perez's volume, "The First Three Years of Childhood," chaps. x, ii, iii, and iv; also the work of Prof. Preyer, "Die Seele des Kindes" (3ter Theil).

On the training of the powers of abstraction the reader would do well to read Locke's valuable chapters on the "Imperfection and Abuse of Words," "Essay," book iii, chaps. ix–xi. The difficulties of exercising the powers of abstraction and the best means of alleviating these are well dealt with by Dr. Bain, "Education as a Science," chap. vii, pp. 191–197. The German reader should also consult Beneke, *op. cit.*, §§ 26–38, and Waitz, "Allgemeine Paedagogik," 2ter Theil, § 21, and Pfisterer, "Paedagogische Psychologie," § 27. In connection with this subject the teacher should read those chapters in logic which deal with terms and their distinctions, and with the processes of division and definition (e. g., Jevons, "Elementary Lessons in Logic," iii, v, and xii).

CHAPTER XIV.

JUDGING AND REASONING.

THE process of abstraction and conception unfolded in the last chapter prepares the way for the higher developments of thought, viz., judging and reasoning. These operations are so closely connected that it is best to consider them together.

Nature of Judgment.—In common life, to judge is to come to a decision about a question, as the judge does in a court of law. This presupposes a question, room for doubt, and a complicated process of weighing evidence. In mental science the term is used in a more comprehensive sense. We judge, whenever we affirm or deny one thing of another, whether the matter is clear and certain, as in saying, "This is a rose," "Two and two make four," or one that admits of doubt, as "This plan is the best." The act of judging is seeing that a thing is so, and being ready to affirm it.

The result of the act is called a judgment. Every judgment admits of being expressed in a statement, or what logicians call a proposition. The "subject" of the proposition answers to the thing about which we affirm, and the predicate to that which is affirmed. Thus, in the statement, "Fire warms," the mind is predicating something about fire, the subject, viz., that it has the power of warming.

It is evident that to affirm one thing of another involves a reference to fact or reality. When a child says that its food is hot, or that a plate is dirty, it thinks of the object as actually in this condition. That is to say, judgment implies belief about a fact. Where we do not believe that a thing really has that which is predicated, we do not judge. Again, it is plain that, since in judging we represent a thing as being so or so, our judgment may be correct or incorrect or mistaken, according as the representation does or does not accord with the real fact. And, finally, for the same reason the proposition which declares the judgment may be either true or false.

That which we predicate or pronounce about a thing in our statement is not in every case the same. Sometimes we comprehend a thing in a class, or endow it with certain qualities, as in the affirmations, "This is a flint," "This knife is rusty." In others we set forth a relation between things, as in the propositions, "Ireland lies to the west of Great Britain," "Heat softens bodies." One important class of affirmations has to do with the relation of similarity and dissimilarity, as in the judgments, "French resembles Latin," "The opposite sides of a parallelogram are equal," "Any two sides of a triangle are greater than the third."

All predication affirms likeness or unlikeness, either explicitly or implicitly. Thus, in placing an object in a class, and less distinctly in attributing to it a certain quality, we are assimilating it to other objects. So again in predicating a relation, as that of cause and effect, between things we are assimilating the particular causal agent as such to other known causes.

It may be seen from this short account of judgment that it is co-extensive with the whole area of knowledge. Everything that we know or think that we know involves an element of judgment, and when it becomes distinct knowledge can be explicitly set forth in a proposition. Thus, even in our every-day acts of perception, we implicitly affirm that what we see is a real tangible thing, that it lies at a particular distance from us, that it presents certain features, and so forth. The simplest act of analysis performed on an object of perception thus involves the rudiment of a judgment. This may not become explicit and express itself in a proposition (audible or inaudible), but the essential activity of judging is present in some measure.

Relation of Concept to Judgment.—It is evident that a judgment, as connecting two ideas one with another, is a more complex mental product than a concept. Every explicit act of judgment implies a concept already formed. We can not affirm anything of a concrete individual object, as when we say, "This stone is a fossil," or "This substance is transparent," without already having the idea of fossil or of transparency.

On the other hand, while the judgment thus presupposes the concept, the formation of the concept itself involves a rudimentary form of judging. Thus a child can not form the idea "heavy" without comparing heavy objects and implicitly affirming them to agree in respect of this quality. Every successive stage of generalization is thus carried out by a process of judging things to be similar. And in building up the more complex concepts of classes, as "iron" or "metal," the child is connecting a number of qualities, e. g., weight, hardness, metallic luster. This work of combining qualities goes on gradually as he comes to discover new properties in things, and is carried out by successive acts of judging. That is to say, the result of an act of judgment becomes embodied in a concept. After finding out, for example, that iron is softened by heat, the child will take up this fact into his idea of iron, which thus becomes fuller and richer. We see, then, that the successive developments of our concepts are effected by means of acts of judgment, and every such enlargement of a concept supplies an element for a higher form of judgment. Thus the growth of conception and judging go on together and assist one another.

Process of Judging.—The mental operation which leads up to decision and affimation may be brief and simple, or prolonged and intricate. Speaking generally, however, we may say that judging involves (*a*) materials for judgment ready to hand, and (*b*) a process of reflecting on these in order to see to what result they point.

(*a*) The materials which enable us to judge about things are supplied either by our own personal experience or by the words or testimony of others. Experience and authority are thus the two great sources of our facts or data.

It is evident that the ability to judge about any matter presupposes careful observation in the past and ready reproduction. I can not decide whether this flower is an orchid, or this stone an onyx, unless I have carefully noted the characters of the class, distinguishing it from other classes. Moreover, unless we observe and recall things in their true connections of time and place, we shall not be in a position to decide about them. Thus, in judging as to the nature of a rock, we need to recall not only the exact appearance of the rocks it resembles, but their position in relation to other strata.

The testimony of others, including tradition and authority, is a great additional source of materials of judgment. A child that trusted exclusively to his own experience, and attached no value to others' statements, would not be in a position to decide about many matters. But authority can easily exercise an excessive influence on judgment. A person who believes a thing just because he is told, when he might find out for himself whether the fact is really so, is not using his materials.

(*b*) The process of reflection on the materials involves an act of will. To come to a sound decision on a matter of any difficulty implies that the mind rejects what is irrelevant, steadily keeps in view all the relevant facts, and weighs well the precise bearing of each fact on the case. And all this is a special exercise of the power of voluntarily concentrating the thoughts. The higher this power of voluntary control of the mental contents, the more clear and rapid the decision.

To judge brings into full play the functions of assimilation and discrimination. In order to judge about any matter, we must be able to detect its affinities to what is already familiar. To say, "This is a flint," implies that the mind classes the object with previously known objects on the ground of certain resemblances. And while assimilation is thus a prominent ingredient in judging, discrimination is no less conspicuous. An act of sense-discrimination is the simplest type of judgment. And in classing an object, e. g., a flint, the mind has to carefully distinguish the essential marks of this from those of other stones with which it might be confounded. It is only when we thus discriminate, and by discriminating assimilate the new to the old in their essential affinities, that we are able to judge accurately.

As a last element in this process of voluntary reflection and control we have the repression of feeling and inclination. When we strongly desire to find a thing so and so, our minds are apt to be biased in this direction. To judge well whether a course is wise or right presupposes that we keep down any inclination or disinclination to this course.

The process of judging having been carried out, there remains the expression of the result reached in suitable language. This is by no means an insignificant part of the operation. Persons who do not clearly seize the meaning of terms, and who are lax in their use of language, are apt to express their decisions badly. Clear thinking includes the ability and disposition to give as precise a form as possible to the expression of the thought.

Affirmation and Negation.—The simplest type of judgment is an affirmation, a positive assertion that a thing is so and so. But all our judgments are not affirmative. Logicians distinguish between affirmative and negative judgments and propositions. We may deny as well as affirm, or say that a thing is not, as well as that it is. Negation refers back to a previous affirmation actually made or suggested to the mind. Thus, to say, "It is not going to rain," implies that the corresponding affirmation ("It is going to rain") has actually been made by somebody, or has somehow been suggested by a question, "Is it going to rain?" or otherwise. Negation is the putting away or the rejection of an affirmation as untrue or false. Our minds are unable to combine the ideas answering to subject and predicate in the way proposed.

It is evident that while affirmation is to a large extent based on a discovery of similarity, negation is based on the detection of difference. If I say, "This is not a real fossil," or "This is not an equilateral triangle," it is because I discriminate the features presented by the object before me from those of the class. Negative judgments are of high importance as setting forth distinctions between things. The mind that is acute in distinguishing facts and ideas naturally resorts to this type.

Logicians tell us that every statement which can be made or proposed must be either true or false: e. g., "Either this flower is an orchid or it is not." Hence it follows that, whenever called on to judge about a matter, the mind has to decide between an affirmation and a negation. For example, we have to make up our minds whether this is a real diamond or a spurious one, whether this boy is guilty or is not guilty, that is, innocent. Hence an act of judgment (when its meaning is made explicit) is in every case a choice between two alternatives, and so it resembles the decision of a judge, to which, as already pointed out, the expression "to judge" seems originally to refer. The ability to decide or make up one's mind about any matter thus depends on the mind's power of discriminating (1) what tells for, and what tells against, a proposition; and (2) which of the considerations (or groups of considerations) has the greater importance.

Belief and Doubt.—So far it has been assumed that the mind must decide one way or another about any matter presented to it. But this is not the only alternative. We may waver between affirming that this is a real diamond and denying it, in which case we are said to suspend our judgment. The mental state thus induced is one of doubt.* Thus I may feel altogether uncertain whether it is going to rain or not, and so can not be said to form any judgment about the matter. This state of mind is opposed to and excludes the state of belief or definite assurance. When we definitely make up our mind about a matter, we say we "are satisfied" that it is so; and this expression shows that our minds are at rest, and we feel ready to act. When, on the contrary, we doubt, our minds are pulled in two directions, there is a sense of conflict or discord, and action is impossible. Doubt is a more complex mental state than belief, involving a grasp of a plurality of opposing considerations. Hence it shows itself later in the history of the child.

Extent of Judgment.—The distinction between affirmative and negative judgments is called one of *quality*. In addition to this, logicians recognize a distinction of *quantity*, or extent. Thus some propositions affirm or deny something of an individual thing, as, "This is a shell." These are called singular propositions. Others, again, predicate something of classes of things. Of these some affirm about a whole class, as, "All shells are built by animals." These are universal propositions. Others, again,

* The etymology of the word (*dubio*, from *duo*, *cf.* German *zweifeln*, from *zwei*) suggests this oscillation of mind between two conflicting alternatives.

assert something about a portion of a class, as, "Some (or many) shells are found in the sea." These are known as particular propositions.

It is obvious that these judgments differ greatly in their value. The most important class of judgments are the universal. These are far more difficult to reach than singular or particular judgments. And it is by help of these, as we shall see presently, that we are able to reason clearly and securely.

Perfection of Judgments: Clearness.—Our judgments, like our notions, have different perfections or excellences. And according to the degree in which these manifest themselves we say that a person has a high or low power of judgment.

Of these perfections the first is clearness. By this is meant that the concepts combined in the judgment be distinct, and that the relations involved be distinctly apprehended. Want of distinctness in terms leads to indefiniteness in statement. The judgment, "Vice is debasing," has just as much clearness to a boy's mind as belongs to the ideas "vice" and "debasing." Not only so, a judgment can not be clear unless the mind discerns all that is immediately implied in the assertion, the equivalence of the assertion to other verbally unlike statements, and its incompatibility with other contradictory statements.

Judgments tend to be indistinct in a number of ways. A common source of indefiniteness is imperfect observation, which may give rise to the vague apprehension of some relation of things, though the exact nature of this relation is not made clear to the mind. Thus if a boy fails to observe how an object was situated relatively to other adjacent objects, or what was the exact order of events in a natural process, he is not in a position to judge about it. Again, defects of memory, by leading to indistinct reproduction, are a great obstacle to clearness of judgment. If the mind fails to recall the exact qualities of things, it will be incapable of making definite assertions about them.

Again, it is to be noted that, as in the case of concepts, so in that of judgments, what was once clear may become hazy or indefinite by the separation of words and ideas. When a boy forgets the facts on which a principle is based, he has no longer a clear perception of its reality and truth. In this way truths, at first clearly apprehended, may in time, by mechanical repetition, pass into lifeless formulæ, in which there is no clear apprehension of the contents and no vivid belief.

Once more, the intrusion of feeling into the intellectual domain inevitably leads to vagueness of judgment. Strong feeling is incompatible with careful observation, fine discrimination of ideas, etc. Judgments passed under the influence of strong emotion are in general characterized by vagueness and exaggeration.

Vagueness of judgment is apt to show itself in a special degree in those beliefs and opinions which we passively adopt from others without seeking to make them our own by personal observation and reflection. A too easy habit of donning the prevailing views of those about us is fatal to the exercise of a clear judgment.

Accuracy of Judgment.—Again, our judgments, like our notions, may be accurate or inaccurate. An accurate judgment is one which corresponds precisely to the realities represented, or which faithfully expresses the relations of things. Want of clearness in judging leads on naturally to looseness of judgment. Propositions which are not clearly understood tend to be *mis*understood. The more flagrant forms of inaccuracy arise from inaccurate observation and inexact reproduction. Strong feeling, too, may bring about a considerable divergence of statement from reality.

In addition to these sources of inaccuracy, we have to recognize the imperfections and limitations of each individual's experience. Our judgments are the outcome of our special type of experience, our individual associations. Accuracy of judgment thus presupposes the interaction of the individual and the social intelligence. The child has continually to rectify his judgments about things by a reference to the standard of common experience.

Other Merits of Judgment.—Besides clearness and accuracy of judgment there are other excellences arising out of the way in which the mind decides and abides by its decisions. Thus a certain degree of promptness in decision is a condition of a good faculty of judging. A mind drawn hither and thither by conflicting tendencies, and unable to master these, is weak in judgment. Children are often unable to decide which is pleasantest or best, just because their minds are mastered by the contending ideas. On the other hand, there is the opposite fault of impulsiveness or rashness, that is to say, an over-eagerness in coming to a decision, accompanied by an impatience of the delay involved in reflecting, weighing evidence, etc. This is still more common in children than the other defect. A good faculty of judgment combines promptness with deliberateness.

Again, a decision is good when it is more than momentary, and exhibits a certain degree of stability. It is natural and proper that a decision when arrived at should persist. Such persistence is clearly necessary to fixity of opinion about things, and to the maintenance of consistency among our beliefs. To assert one thing to-day and another thing to-morrow shows a feeble and untrained faculty of judgment. Vacillation in opinion, e. g., about the worth of things, the characters of others, and so forth, is common in the unformed mental state of childhood. On the other hand, our judgments are liable to be modified by new influences, whether new facts of experience, new communications from others, or, finally, further processes of reflection on our data. Hence, if firmness and consistency of judgment are a merit, obstinacy is clearly a defect. Persons of narrow experience and rigid mental habits show this narrowness. In children this rigidity is rare. Openness of mind is proper to the stage of ignorance. The first condition of mental growth is that we keep our minds open to new impressions, and the longer we retain something of the child's susceptibility to new impressions, the longer shall we continue to grow. Excellence of judgment is thus seen here, too, to lie between two extremes, viz., instability and obstinacy.

Closely related to the quality of stability is that of independence. When there is no strong individual opinion, the mind is at the mercy of the social surroundings of the time. Children of a less robust character are prone to an excessive leaning on the judgments of their parents or companions. On the other hand, a disregard of the beliefs of others is the mark of an obstinate and intractable intelligence. An opinionated, priggish child, that is above correction by others, is as disagreeable as it is happily rare. Here, again, excellence of judgment lies between two extremes. A mind that judges well about things combines a measure of intellectual independence with a due regard for the claims of others' convictions.

Inference and Reasoning.—Whenever the mind passes from one fact to another, regarding the first as a sign of the second and accepting it previously to actual observation, it is said to infer. Thus we infer when we notice that the sky is overcast, and predict a shower of rain. The belief in the coming shower is produced by the observation of something which our experience has led us to regard as a mark of this event.

It is evident from this example that inference is based on the detection of similarity among facts or experiences. Thus I predict the shower because I identify the present aspect of the sky with previously observed appearances which were actually followed by rain. In recognizing a part of the whole present situation, viz., the lowering sky as similar to the previous one, I recognize the other parts, viz., what followed, the rain. In inference, we identify things or events in their connection with or their relation to other things or events, and so are able to go beyond what we actually see at the moment—the known—to what we do not see—the unknown.

Inference may assume a lower or a higher form. In the former, the mind passes at once from particular facts in past experience to other facts, without clearly setting forth the ground or reason of the conclusion. Thus a child infers that this water will wet, this grown-up person be able to tell him something he wants to know, and so forth, without making clear to his mind the general truth that all water wets, or that grown-up people are in general superior in knowledge to children. This way of inferring from particulars to particulars may be called implicit reasoning. It is the primitive and instinctive mode of inference. The lower animals, when inferring as to the proximity of prey, enemies, and so forth, do so in this way. And children, before they acquire the use of general language and abstract ideas, habitually draw conclusions in this informal manner. From this primitive and informal inference we have to distinguish explicit, formal, or logical reasoning. In this process the mind distinctly seizes a general truth and makes this the ground of its conclusion. Thus, when a child grows in intelligence, he will learn and understand that adults are better informed than children; and, seizing this truth, he will be able to reason that any given individual will show the same characteristics.

The advantages of this formal procedure are apparent. So long as a child passes directly from one fact to another on the ground of similarity or analogy, his conclusion is more or less precarious. If, for example, a boy infers that a piece of wood will float because other pieces have float-ed, he may make a mistake. If, however, he first satisfies himself on the general question whether all sorts of wood float, he will be able to conclude with certainty. These advantages of definiteness and certainty lead to the gradual adoption of the higher and logical form of reasoning, so far as it can be made use of. All the higher processes of thought, including the whole of what we mean by science, are illustrations of explicit or logical reasoning.

Relation of Judging to Reasoning.—We may now understand the relation of judging to inferring. In its higher or more developed form reasoning presupposes judging. Formally considered, reasoning is passing from certain judgments to other judgments. Thus, before a boy can explicitly argue that a particular substance will float in water, he must have already judged that all substances of a certain order (e. g., those lighter than water) will do so.

While, however, judgment is thus necessary to formal reasoning, there is an element of inference in most, if not all, our processes of judging. Thus, in the simple act of recognizing an object by certain marks, the mind commonly goes beyond what is actually observed at the moment. If, for instance, I say, "This is a flint," I virtually assert that it is hard, that I can strike sparks out of it, and so forth. And this ingredient of inference becomes much more distinct in certain complicated processes of judging, e. g., as to the genuineness of a coin or a picture.* Finally, it is plain that every process of reasoning ends in a judgment as its result or conclusion. In this way our reasoning processes help us in reaching our judgments; while, reciprocally, our judgments, when reached, become start-

* Our every-day judgments about matters of probability are really inferences from past experience, often of an "instinctive" or semi-conscious character, but capable, to some extent, of being set forth formally according to certain laws or principles of probability.

ing-points for new processes of reasoning. The relation is one of mutual dependence, similar to that between conception and judging.

Inductive and Deductive Reasoning.—The full explicit process of reasoning by way of a universal judgment is commonly said to fall into two parts or stages. (*a*) Of these, the first is the operation of reaching a general truth or principle by an examination and comparison of facts: this is known as induction. (*b*) The second stage is the operation of applying the truth thus reached to some particular case: this is known as deduction. Induction is an upward movement of thought from particular instances to a general truth, principle, or law; deduction a downward movement from some general principle to a particular conclusion.

(A) Nature of Inductive Reasoning.—The process of inductive reasoning illustrates the fundamental activity that underlies all thinking, viz., the detecting of similarity amid diversity. Let us examine an instance of deductive reasoning. The child observes that his toys, spoons, knives, he himself, and a vast multitude of other objects, when not supported, fall. He gradually compares these facts one with another, and seizes the essential circumstance in them, and the general truth implied in them. He notes that what all these things have in common is that they are material bodies. He then detaches this circumstance, and along with it the incident (falling to the ground) which has invariably accompanied it. That is to say, he judges that all material bodies tend to fall.

It is obvious that, in reaching this universal truth, the young investigator is going far beyond the limits of actual observation. For the proposition includes every or any material body wherever met with. It is thus a process of inference, and its result a conclusion.

The process is clearly related to that of generalization described above.* In each case we trace out a similarity among a diversity of things. The difference is that, whereas in the case of generalization we assimilate things merely as such, in the case of induction we assimilate things viewed in their connection with some other thing. Moreover, just as there are higher and lower conceptions, so there are higher and lower inductions. The child begins with a number of narrow inductions, e. g., "Flies die," "Birds die," and so forth. He then compares these one with another, and, extracting what is common to them, reaches the higher truth, "All animals die." Later on he couples this with the kindred truth similarly reached, "All plants die," and so arrives at the yet more comprehensive induction, "All living things die."

Spontaneous Induction.—Although children commonly draw inferences directly from particulars, they show, when they acquire the power of abstraction and the command of words, a tendency to draw general conclusions from the facts of their experience. An instance or two, especially if they are striking and impressive, may suffice to beget the inference to a general rule. One experience of the burning properties of fire is enough for an induction: "The burnt child dreads the fire." This natural impulse leads in early life to hasty induction. Here is an example: A boy of two and a half was accustomed to dwell on the fact that he would in time grow to be big. One day, as he was using a small stick as a walking stick, his mother told him it was too small; on which he at once remarked, "Me use it for walking-stick when stick be bigger." He had implicitly argued that all things tend to grow bigger in time. The inductions of the young and of the uneducated are often of this type. The tendency of all of us is to argue that what is true of ourselves, and of

* Indeed, induction is often called generalization, as when we speak of "a hasty generalization," meaning a general statement hastily built up from fact or experience.

our own little sphere of observation, is true of mankind and of things generally.

Regulated Induction.—This natural impulse to build up general conclusions on a narrow and precàrious bàsis becomes corrected by wider experience as well as by education. Thus the child that argues that all nurseries have a rocking-horse like his own, that all dogs take to the wàter, and so on, learns, either by his own observations or from what others tell him, that his conclusion is hasty and inaccurate. Pulled up, so to speak, in his early attempts to reach a general truth, he grows more cautious. The impulse to comprehend particular facts under a general truth is not arrested; it is simply guided and controlled. Induction now proceeds in a more circumspect and methodical manner. The young inquirer takes pains to collect a wider variety of observations, and so learns to distinguish between what is true of a part of a class and what is true universally. Not only so, he examines the instances he thus collects more closely, in order to ascertain their deeper and essential, as distinguished from their superficial and accidental, resemblances. Thus, for example, he finds out that the fact of growth is connected with life, and he will consequently restrict the idea to living things.

Induction and Causation.—Among the most important truths reached by way of this process of inductive comparison are those having to do with the causes of things. In order to produce any result, we must know the conditions which regulate or determine it. We can only predict events with certainty when we know the circumstances on which they depend. Hence, inquiry into the causes of things has always constituted a chief part of human investigation. This is seen in the very use of the word "reason." To find the reason for an occurrence commonly means to ascertain its cause, and so to explain how it happened or was brought about.

Children's Idea of Cause.—The child's daily experience is continually presenting events or occurrences in a certain order. Thus he soon finds out that food satisfies hunger, that water quenches thirst, that a hard blow gives him pain, and so on. He soon learns, too, that his own actions produce certain results. Thus he discovers that he can break a stick (if not too stout) by bending it, that he can open the door by turning the handle and then pulling (or pushing), etc.[29] Later on he observes that things about him are related to one another in the same way; for instance, that the appearance of the sun is connected with daylight, of rain with muddy streets. Numerous experiences of this kind gradually suggest to his mind the idea of cause. He then goes beyond the limits of the cases of causal dependence which he has actually observed, and mounts to the universal principle: everything that happens has its cause.

There is good reason to suppose that the child molds his first idea of cause on the pattern of his own actions and their results. The first inquiries of young children, "Who made the snow?" "Who made the flowers grow?" and so forth, point to this conclusion. The production of any natural result is thought of as brought about by a conscious action analogous to his own actions. The full development of this idea is seen in the common supposition of young children that everything has its use or purpose. The meaning of the question "Why?" in the mouth of a child of three or four seems equivalent to, "For what purpose or end?" It is only after a certain development of intelligence has been attained that children learn to distinguish between the sphere of human action with its purpose or end, and that of natural or physical causation.

Natural Reasoning about Causes.—The natural impulse of the young to rise from particulars to generalities is illustrated in a peculiarly striking manner in their inferences as to the causes of things. The early age at which they begin to inquire into the causes of events favors the hypothesis that they have an inherited disposition to think in this way, that is to say, to view events as dependent on certain antecedent conditions. The play of this natural impulse results in many hasty inductions. A very slight analogy between things often leads a child to conclude that they have the same cause or can be acted upon by the same forces. This shows itself in an amusing form in the early reasonings of children. Thus a boy two years and ten months old said one day he would put water on some bits of bread lying on his plate in order to get rid of them. He here reasoned badly from the analogy of dissolving sugar in milk, etc.

Hasty induction with respect to causes shows itself, too, in other ways. The desire to find some cause for a thing often leads to the fixing of the mind on any attendant circumstance, though this may be only accidentally present in the case, and has nothing to do with the effect produced. Thus a little boy of two once argued that milk was white because it came from a white cow which he had happened to see; and on another occasion, finding his milk cold, he said, "Cold cow make milk cold." *

Again, the mind is apt to argue that a thing is always produced by one and the same cause, and this leads to error. Thus a child when just two years old, having one day scratched himself, and, being asked how the blood came on his hands, said, "Fell down on path," and a few months later the same child argued that the slipping off of his glove was the result of the wind blowing it off. In these cases the impulse to account for things by aid of causes already known led to a total neglect of observation. Children argue that all pretty things are bought in shops, that plants injured by the wind have been broken by human hands, and can be mended by the same, and so forth.

* It is probable that each of these hasty inferences was based on observations of the transmission of a quality or state from one body to another.

Regulated Reasoning about Causes.—The careful discovery of causes is often a very difficult process, and always implies an orderly method of procedure. This is seen in its perfect form in scientific investigation.* Among the more important processes here involved are a careful observation and retention of a variety of instances of the effect produced, and further a painstaking analysis of these instances, and a discrimination of what is invariable and essential in the circumstances from what is variable and accidental. Thus, in order to ascertain the causes of combustion, we compare numerous instances, as the burning of coal in the grate, the gas flame, and so forth, and by analyzing these, and eliminating what is accidental, arrive at the common circumstance, the presence of certain combustible substances, and of oxygen, with which these tend to combine.

The process of scientific induction implies, further, active experimenting with things. By this means we can vary the surroundings of the phenomenon or process we are observing as we like; and by so doing are far better able to ascertain what circumstances can be taken away or eliminated without affecting the result, and what can not. Thus, in inquiring into the cause of combination, we find that the nitrogen of the air can be removed and the process of combustion still go on, while the oxygen can not thus be dispensed with.

It is evident, from this brief inquiry into inductive reasoning, that, in order to carry out the process properly, much care and industry are needed. Good induction presupposes a trained faculty of observation. A thorough examination of facts includes two things: (*a*) the inspection of a sufficient number of instances, and (*b*) the adequate scrutiny and analysis of the facts that are observed.

* The term "induction" is commonly restricted to this orderly and exact type of investigation, the term "generalization" being used for rough every-day modes of reaching general propositions.

A defect in respect of the first condition leads to "hasty generalizing," as when a child says that his parent or teacher is unfair by confining his attention to one or two ambiguous cases, and not considering his general manner of acting. A defect in respect of the second condition tends to beget misapprehension, as when the child calls his teacher unfair on the ground of one or more actions, a deeper examination of which would show that there was no real injustice involved. Finally, the due performance of the inductive process implies that the investigator keeps his mind free from prepossession and bias, ready to accept any truth which the facts reveal to him, whether they answer to his expectations and his particular inclinations or not.*

* The reader should note the close correspondence between the sources of erroneous induction and those of inaccurate conception mentioned above.

Aeyon

CHAPTER XV.

JUDGING AND REASONING (*continued*).

Deductive Reasoning.—By induction the child reaches a large amount of general knowledge about things, including the properties of substances, the causes of changes in things, the laws that govern human action, and the simpler truths of space, quantity, and number. In arriving at these, he is of course greatly aided by others' instruction, and in many cases he derives his general knowledge in the first instance exclusively from what others tell him. Having thus amassed a quantity of general knowledge, he is able to pass on to the second stage of explicit reasoning, namely, deduction. By this is meant reasoning downward from a general truth or principle to some particular case or class of cases. Thus a child who has found out, partly by observation and partly by instruction, that all persons are liable to make mistakes, is apt to apply the truth by arguing that his mother or his governess makes mistakes. The type of deductive reasoning when fully set forth is known as a syllogism, and is as follows:

All animals suffer pain.
Flies are animals.
Therefore they suffer pain.

Or for negative arguments :

No lazy children get on.
This is a lazy child.
Therefore he will not get on.

The essential process here, as in induction, is detecting similarity or assimilation. We bring a particular case (e. g., flies) under the general rule or principle (animal suffering); and we do this because we recognize *identity* between the particular case and the cases included under the general rule.

While the recognition of likeness is thus the essential process in deduction, discrimination plays an important subordinate part. In all arguments by which we read negative conclusions, we are especially engaged in distinguishing things, qualities, or promises which differ. Thus when a parent, reasoning with his child, says, "That boy is not a gentleman, for no real gentleman despises the poor," he is distinguishing between the genuine marks of a gentleman and those which point to a vulgar, ungentlemanly type of mind.

Application of Principles and Explanations.—Deductive reasoning may begin at one of two ends. We may have a principle given us and be asked to draw conclusions from it. This is applying a principle, or finding out new illustrations of a truth. New discoveries may be made by a skillful combining of truths already known. Thus, for example, a child, after being told, or having discovered, that air has weight, and that it is elastic or compressible, might find out for himself that the lower strata must be denser than the higher. In this way the mind is able to anticipate observation, and to conclude beforehand as to how things will happen.

On the other hand, we may set out not with a general truth, but with a particular fact or statement, and seek for some more general truth under which it may be brought. This is known as explanation. Explanation, in its simplest form, is throwing light on a new and unfamiliar fact by pointing out its analogy to some familiar fact. This is the only explanation possible in the case of young children who can not yet grasp general principles. A higher kind of explanation is including a particular case under some general principle. Thus we explain a natural occurrence, as the trade-winds or the rising of water in springs, by referring to the known agencies which produce them. Similarly, we find a reason for a statement by bringing it under a more general rule. Thus the teacher justifies some command or prohibition, e. g., "cribbing" from another, by presenting it as a special case of a more comprehensive rule, e. g., unfairness or deceit.*

Regulated Deduction.—The processes of deductive reasoning may lead to a valid or invalid conclusion. It is the business of logic to point out what conditions must be satisfied in order that a conclusion may be accepted as valid.

Without going into the technical details of deductive error or fallacy, we may point out that, since reasoning is essentially a detection of similarity, the great source of erroneous reasoning is confusion of things that are not really and fundamentally similar; in other words, a want of discrimination. The bad reasoner can not see where similarity ends and difference begins. Among the most common errors in deductive argument are those arising from the ambiguity of terms. When the mind fails to distinguish between different shades of idea attaching to the same word, it is exceedingly liable to go astray. Thus if it were argued that, since all knowledge is the result of self-education, children would be much better for being left to themselves, the reasoner might be convicted of confusing two meanings of self-education, viz., that of a gifted youth like Pope, who takes his education into his own hands, and that which every child can and may be expected to carry out *under the stimulation and guidance of others*. Our very eagerness to find a reason for a fact may precipitate us into this confusion of ideas,

* On the different meanings of "explanation," see Jevons's "Elementary Lessons in Logic," chap. xxxi.

and so into loose reasonings. And any agitation of feeling, by blunting for a time the discriminative power, is greatly favorable to such confusion of thought.

This liability to confused thinking is furthered by the circumstance that, in our processes of reasoning, words tend to become the substitutes of clear ideas about things. A mind exercised in argument can easily appreciate the logical relations between any given propositions without going to the trouble of carefully scrutinizing the meaning of the terms. Hence, the risk of accepting what is told us by others without adequate critical examination of the ideas involved. If there is only the appearance of a logical order in another's statements, we are strongly disposed to accept the reasoning as valid.

Other Forms of Reasoning: Analogy.—In addition to induction and deduction it is usual to specify other forms of reasoning. Of these the most important is known as analogy. When we reason by analogy we perceive a certain partial resemblance between things, but are unable to detect that perfect identity in essential features or circumstances on which induction proceeds. Thus it is to reason from analogy to say that, since the relation of the mother country to a colony, or of a teacher to his pupils, resembles that of a parent to a child, the same feelings should be excited in the former as in the latter case; or to argue that, because other planets resemble our earth in certain respects, they agree with it further in the possession of living forms.

Since there is only a partial resemblance in these cases, the conclusion can never have the certainty of a proper scientific induction. Hence, this form of reasoning should only be resorted to where the processes of induction and deduction are impracticable. The teacher has often to illustrate a subject by analogies and parallel cases. Mental and moral qualities are to a certain extent illumined by analogies with material properties and processes. Not only so, before the child is able to carry out the processes of analysis, etc., necessary to induction, he is only able to reason from analogy, e. g., an unanalyzed perception of resemblance; and so the educator must content himself with partial explanations of Nature's processes based on analogy. The value of such analogical reasoning depends on the detection of real as distinguished from false points of analogy, and on its being resorted to only as a provisional explanation, and a stepping-stone to a truly scientific explanation.

Development of Powers of Judging and Reasoning.—The processes of judging and reasoning in their clear and articulate form show themselves later than the process of conception. A child a year old will, as we have seen, name objects, and form rudimentary notions about things, but he can not yet form explicit judgments. In the early period of speech we have only rude germs of affirmation, as when a child exclaims "Bow-wow!" (there is a dog), or "ot!" (this food is hot), and so forth. An interesting variety of these compressed judgments is the sign of disappearance (e. g., ta-ta), which, as M. Perez remarks, seems to imply ceasing to exist.* The first explicit judgments are concerned with individual objects. The child notes something unexpected or surprising in an object, and expresses the result of his observation in a judgment. Thus, for example, a child, whom we may call C, was first observed to frame a distinct judgment when nineteen months old, by saying "Dit ki" (sister is crying).

These first judgments have to do mainly with the child's food, or other things of supreme practical interest to him. Thus, among the earliest attempts at combining words in propositions made by C, were the following: "Ka in milk" (something nasty in milk); "Milk dare now" (there is still some milk in the cup). Toward the

* "First Three Years of Childhood," p. 170.

end of the second year the range of discernment shows a marked extension, the child coming now to observe and remark on anything new or striking in the objects that present themselves, such as unusual size, position, etc. Thus, at this date, C was observed to exclaim "Dat a big wow-wow" (that is a large dog); "Dit naughty" (sister is naughty); "Dit gow ga" (sister is down on the grass). As the observing powers grow, and the child's interest in things widens, the number of his judgments increases. And as his powers of comparing objects and detecting their relations develop, his judgments gradually take on a more penetrating character. This progress in affirming is of course dependent on the advance of the child in the command of words, and the constructive skill necessary to framing sentences. The transition to more elaborate statements shows itself by the end of the second year in tentatives of this type: "Mama naughty say dat."

An interesting phase of this early stage of the growth of judgment is the acquisition of the signs of negation, "no," "not." The first sign of negation is a shake of the head; but this is used as a mark rather of unwillingness or disinclination than of logical rejection. C did not make a distinct negative statement till well on in his third year.

The employment of the sign "no" presupposes a knowledge of two alternatives (truth and falsity.) It is greatly aided by the habitual employment of *questions*. A question when understood brings home to the mind two opposed and mutually exclusive statements. The way in which the negative particles are first used is very instructive. C (early in his third year) was in the habit of framing a statement and then appending the sign of negation thus: "N [his name for himself] go in water—no." It was observed, further, in the case of two children, that during the third year they were apt to couple affirmative and negative statements, e. g., "This I's cup, not mama's cup"; "This a nice bow-wow, not nasty bow-wow." This suggests that a child, when he first begins to understand the meaning of a negation, feels impelled, when making an affirmation, to set forth explicitly the negation implied.

As intelligence develops, the child's sphere for judging is gradually widened. The exercise of imagination opens up to him many new subjects to judge about, e. g., the ways of men and animals. At the same time, the accumulation of the fruits of his own experience supplies him with fuller means of judging about things. Not only so, he now becomes capable of judging not only about particular objects, but about classes. Thus he picks up and repeats the general statements made by those about him, as, for example, "Naughty children play with the dirt." The extension of the vocabulary and the progress of abstraction and conception gradually lead to a more abstract type of judgment.

The growth of the power of judging is marked by an increase of a cautious and critical spirit in relation to affirmation. Things and their relations are more firmly discriminated, and as a consequence are described more clearly and minutely. Again, the tendencies to exaggeration and misstatement due to the influence of feeling (e. g., the desire to astonish or amuse) are gradually checked, and so the judgments gain in point of accuracy or fidelity of representation. Along with these changes, we may note that the child's tendency to give reality to the productions of fancy is brought under restraint. By the aid of his growing experience he is able to fashion a rudimentary standard of what is possible and impossible, probable and improbable; and as a result of this he becomes more cautious in making assertions. Finally, this progress in critical discernment shows itself in examining and rejecting what is unconnected with what he already knows. The approach of the close of childhood is appropriately marked by a considerable increase of independence in judging about things.

Growth of Reasoning Power.—In close connection with this progress in judging there goes on the development of the power of inferring or drawing conclusions. At first, as observed, the process is implicit, from particulars to particulars, from one fact or situation to another more or less like it. The first exercise of the power is seen in doing things, in adopting means to ends by the help of analogies, with previous experience. Thus the first distinct trace of a reasoning operation in the case of C appeared when he was seventeen months old. He asked for bread and butter (which he called "bup"). Not being immediately attended to, he stretched out his hand toward the bread-knife lying on the table, still repeating the sound. This action of pointing was manifestly an extension to a new case of the known results of pointing, and moreover implied the recognition of a relation between the knife and the satisfaction of his want. A more advanced step was noted at the end of the twenty-first month. His father told him not to eat some brown sugar which he was taking out of a bag. He answered promptly and emphatically "Ni!" This was clearly finding a reason by way of justification, "I eat it because it is nice."

First Reasonings about Cause.—As already observed, the child's first reasonings about cause are very crude. He snatches from his past experience any analogous case in order to explain the happening of things. This leads to an anthropomorphic interpretation of events. For example, C in his twenty-fourth month found a pebble in his box of bricks. His mother asked him what it was doing there, and he replied, "Wa pay bricks." *

* That is, "Wants to play bricks." In justice to C, it must be added that he instantly went on to reflect. Looking at the pebble, he sagely observed, "No ands" ("It has no hands").

Early in his third year he got into the way of asking who made this and that thing. He argued that everything imperfect, such as a flower without a stem, could be "mended." Again, noticing pips in an orange, he asked, "Who put pips there—cook?"

By the end of the third year a child is wont to perplex his mother by asking the "why" of everything. This is an important moment, as indicating the development of a vague general idea that things have their causes and reasons, and are capable of being explained. But the type of causation is still anthropomorphic. He looks at things as occurring for a purpose, and can only understand them in so far as they present some analogy to his own purposive actions.

As the child's mind develops, he shows greater power in examining what he sees, analyzing it into its constituent parts, and comparing his experiences one with another. In this way wider inductions and truths of a more abstract character are gradually arrived at. At the same time, his power of discriminating things progresses, and leads to a more careful discernment of the elements of his experiences, and so to greater caution in making general statements. Thus children from about the end of the fourth year may often be observed to use the expressions, "Some persons," "Many persons," "generally," and so forth.* It is by the same progress in discriminative power that the regions of natural events and conscious action are gradually distinguished one from another, though the completion of this distinction probably falls toward the end of childhood, if not later.†

The same line of remark applies to the progress of deductive reasoning. A boy of three or four will apply a simple rule to a particular example. But such applica-

* See a good instance given by M. Perez, *ibid.*, p. 177.

† A girl aged five years nine months once asked her mother, "What makes the wind, mama? Is it a great big fan somewhere?"

tions are of the most obvious kind. To recognize that a thing is heavy, and so capable of hurting, or that pulling flies to pieces is cruel, and so wrong, demands but little power of tracing out similarity in the midst of difference. The growth of reasoning power manifests itself in discovering the less obvious applications of a rule or principle, as that it is cruel to deceive another. This is the result of many exercises of the faculty. As the child's stock of general truths increases, he will find more and more scope for exercising his reasoning powers in drawing conclusions from them. A boy of five or six delights to apply the truths he knows by way of accounting for what he sees. Later on, after his powers of deductive reasoning have been thus strengthened in these comparatively simple exercises, he will be able to perform the more prolonged and difficult feats of argument, such as working out a demonstration in Euclid.

Varieties of Power of Judging and Reasoning.—There are well-marked differences among individuals in respect of their ability to judge and to reason about things. Thus one person can more readily compare any given material, part with part, and decide on the particular point raised. In the uncertain region of opinion, as distinguished from that of demonstrable truth, individuals display a surprising amount of difference in the way in which they judge.* So, too, we remark differences in people's ability to reason about things. Thus of two men face to face with the same group of facts, one will leap quickly to the general law or principle underlying them, while another will fail to detect it. Similarly, one man much more readily brings new facts under old truths than another.

These differences, like those in the case of the other

* This fact is satirized by Pope in the lines—

"'Tis with our judgments as our watches; none
Go just alike, yet each believes his own."

faculties, are general or special. A may have a better faculty of judging on various sorts of matter than B; or, as commonly happens, he will show a marked superiority in a certain domain, e. g., practical matters, matters of taste, and so forth. In like manner, A may be a better all-round reasoner than B, or show his superiority in some special direction. Thus there is the "inductive mind," quick in the observation and analysis of facts, and delighting to trace out the laws of phenomena, the type of the physical inquirer. On the other hand, there is the deductive or demonstrative mind, given to dwelling on abstract truths rather than on concrete facts, and skillful in combining these into an orderly argument, the type of the mathematician. Not only so, excellence of reasoning power commonly displays itself in relation to some particular kind of subject-matter, as the domain of human action and history, geometry, or the science of physics. These differences, like other intellectual inequalities, turn partly on inequalities of native aptitude, and partly on differences in circumstances and education.

The power of judging well presupposes a native ability to dissect a subject-matter, compare, discriminate, and so forth. But it is a power that receives much of its peculiar character from experience and education. Judging is the outcome of experience, and will vary as this. Not only so, a ripe power of judgment in any region of experience presupposes special exercise in that domain. To judge on a doubtful point in a classification of plants implies the trained botanist's faculty. Similarly, in the case of the ability to reason well. Individuals are not at the outset equally endowed with the powers of abstraction, of tracing similarity veiled under superficial difference, necessary to reasoning. But the special direction of the reasoning faculty depends largely on special practice. A boy of an active and mechanical turn, given to observing the action of Nature's forces, will tend to become a proficient reasoner in that domain.*

Training the Faculty of Judgment.—The training of a child's power of judging begins in close connection with the exercise of the observing powers. He should be encouraged to compare the size and shape of objects, to note the signs of distance, and so forth.† He should then be induced to express the results of his observations in words, to describe the object he has seen, to narrate something which has happened to him. As supplementary to this, he should be exercised in repeating carefully what he has heard, and in accepting and rejecting propositions. Here the parent or teacher should aim at caution in judgment. The natural propensity to accept as certain what chimes in with our wishes and inclinations should be checked.‡ In close connection with this the child should be exercised in accuracy of statement. The natural tendency of the young to exaggerate needs to be carefully watched and counteracted. The child should be accustomed to think well about the words he uses, to see all that is implied in them, as well as all that is contradicted by them. By such exercises he will be led to reflect on his own mental operations, and so to give greater precision to his thoughts.# And here a knowledge of the logical processes, relations of propositions included under the term "opposition," and also of the processes of obversion and conversion, will prove serviceable to the

* The effect of practice or habit in improving the reasoning power in special directions is well shown by Locke. ("Of the Conduct of the Understanding," sec. 6, pp. 20, 21.)

† See Miss Edgeworth, "Practical Education," iii, p. 196.

‡ "That point of self-education which consists in teaching the mind to resist its desires and inclinations, until they are proved to be right, is the most important of all." (Prof. Faraday.)

"L'enfant qui s'attache à bien choisir un terme, connâit et juge la pensée qu'il veut exprimer ; il y a en lui ce retour de l'intelligence sur elle-même qui constitue la réflexion." (Madame Necker.)

teacher.* At the same time, this regulation of judgment is a matter of some delicacy. Children delight in vivid and picturesque statement, and a touch of exaggeration is perhaps pardonable. A too strict insistence on precision in the early stages may easily discourage confidence, and lead to an untimely hesitation in judgment.

A perplexing problem in the training of the judgment is to draw the line between excessive individual independence and undue deference to authority. The power of judging is, as we have seen, more fully exercised when the child forms an opinion for himself than when he passively receives one from his mother or teacher. To exercise the judgment is thus to draw out his power of judging for himself. And this can be very well done in certain regions of observation, as, for example, in judging about the beauty of natural objects and works of art. On the other hand, it is obvious that, with respect to other matters, the child's liberty of judging must be curtailed. It would not do to allow a young child, with his limited experience, to decide what is possible or probable in a situation of any complexity, and still less to permit him to pronounce on the rightness or wrongness of an action. To combine the ends of authority and of individuality in respect of judging requires much wisdom and skill in the trainer of the young. Differences of children's temperament must here be taken account of. An indolent, timid child, wanting in self-reliance, and disposed to rely on others to excess, requires another *régime* from that suitable to an over-confident child.

As the intelligence develops, greater scope should be given the child for the exercise of his judgment. Thus, by widening the sphere of his free activity, the parent calls forth his practical judgment. An important region for

* The process of obversion, by which every affimative proposition may be expressed as a negative one, and *vice versa*, is dealt with by Dr. Bain. ("Logic," "Deduction," bk. i, chap. iii.)

the unfettered play of the faculty is that of matters of taste. The child should be encouraged to judge for himself what is pretty, and so forth. The power of deciding on doubtful matters of motive, wisdom, and testimony may be exercised by an intelligent study of history. Here, too, there is scope for the exercise of the moral judgment. Finally, the study of literature exercises in a special way the critical or æsthetic judgment.

Training of the Reasoning Powers.—The work of training the young in careful processes of reasoning must go on hand in hand with the development of his power of judgment. In the earliest stage (from about the beginning of the fourth year) the mother is called on to satisfy the child's curiosity or desire for explanation. This period is an important one for the subsequent development of the child. Parents are apt to think that children not infrequently put questions in a half-mechanical way, without any real desire for an explanation, and even for the sake of teasing. This view, however, as we shall see later on, is probably erroneous. Children are no doubt capricious in their questionings; their curiosity is restricted in its range, and momentary in its duration. Still, their questionings may in general be accepted as expressing at least a passing desire for knowledge. And, so far as this is the case, it is well to heed and satisfy them so far as may be. It seems a good rule to give an explanation wherever the nature of the subject allows of a simple one. This is Locke's advice, "Encourage his *inquisitiveness* all you can, by satisfying his demands and informing his judgment, as far as it is capable" ("Some Thoughts concerning Education," § 122).

At the same time, the educator should take care in answering children's questions not to indulge them in intellectual indolence and weak dependence on others. They should be stimulated to find out to some extent for themselves the reasons of things. "A word or two," writes

Madame Necker, "in order to put him on the way, often in order to make him discover that by thinking well about the matter he might have been able to assure himself, these words, I say, will be seeds which will fructify with time."

In some cases, no doubt, children's questions are apt to be very awkward, and even unanswerable. Thus a little girl of four and a half years once drove her mother to one of the most difficult problems of philosophy—thus: She sees a wasp on the window-pane, and wants to touch it. Her mother says, "No, you must not; it will sting you." Child: "Why doesn't it sting the glass?" Mother: "Because it can't feel." Child: "Why doesn't it feel?" Mother: "Because it has no nerves." Child: "Why do nerves feel?" The young must be accustomed to the idea that there are many things that they can not yet understand, and be exercised in taking some truths on trust, and not insisting on knowing the "why" of everything. George Eliot says somewhere, "Reason about everything with your child, you make him a monster, without reverence, without affections."[30]

But the training of the reasoning powers includes more than the answering of the spontaneous questionings of children. The learners must be questioned in their turn as to the reasons of things, and the causes of what they see happening about them. A question sets a child thinking, raises a new problem in his mind, and so stimulates his powers of thought. Not only so, the asking the why and wherefore of things helps to familiarize the child's mind with the truth that everything has its cause and its explanation. The parent or teacher should aim at fixing a habit of inquiry in the young mind by repeatedly directing his attention to occurrences, and encouraging him to find out how they take place. Here, of course, great discernment must be shown in selecting problems which the child's previous knowledge will enable him to grapple with. This exercise of the child's mind, in discovering the reasons of things, involves a method, training in orderly recollection; in going back to his past experiences to search for fruitful analogies, and to his acquired principles for the true explanation.

The systematic training of the reasoning powers must aim at avoiding the errors incident to the processes of induction and deduction. Thus children need to be warned against hasty induction, against taking a mere accidental accompaniment for a condition or cause, and overlooking the fact that one result may have a plurality of causes. This systematic guidance of the child's inductive processes will be much better carried on by one who has studied the rules of inductive logic. In like manner the teacher should seek to direct the young reasoner in drawing conclusions from principles, by pointing out to him the limits of a rule, by helping him to distinguish between the cases that do and those that do not fall under it, and by familiarizing him with the dangers that lurk in ambiguous language. And here some knowledge of the rules of deductive logic will be found helpful.

Subjects which exercise the Reasoning Faculty.—The training of the reasoning faculty should be commenced by the mother and the elementary teacher in connection with the acquisition of common every-day knowledge about things. Its completion, however, belongs to the later stage of methodical school instruction. There is no subject of study which may not in the hands of an intelligent and efficient teacher be made helpful to this result. Thus the study of physical geography should be made the occasion for exercising the child in reasoning as to the causes of natural phenomena. History, again, when well taught, may be made to bring out the learner's powers of tracing analogies, of discovering the causes and effects of human action, and deducing particular results from well-ascertained principles.

The teaching of science is, however, the great agency for strengthening and developing the reasoning powers. Science is general knowledge expressed as precisely as possible, and the study of it serves to give accuracy to all the thinking processes. Science is further an orderly arrangement of knowledge according to its dependence. It sets out with principles gained by induction, and then proceeds in a systematic way to trace out deductively the consequences of these principles. It thus serves to train the reasoning powers in an orderly and methodical way of proceeding.

Some sciences exhibit more of the inductive process, others more of the deductive. The physical sciences are all, to some extent, inductive, resorting largely to observation, experiment, and proof of law by fact. And some of these, as, for example, chemistry and physiology, are mainly inductive. In these the inquirer is largely concerned with observing and analyzing phenomena and arriving at their laws. Hence they provide the best training of the mind in the patient and accurate investigation of facts, and the cautious building up of general truths on a firm basis of actual observation. On the other hand, the mathematical sciences are almost entirely deductive. Here the principles, being simple and self-evident, are stated at the outset in the shape of axioms, etc.; and the development of the science proceeds by combining these principles in ever new ways, and arriving at fresh results by a process of rigorous deduction. This process of demonstration, which shows how the conclusions necessarily follow from the principles, is an exercise of the logical faculty of very peculiar value. Hence mathematics has commonly been held up as the best instrument for disciplining the mind in exactness and consistency of thought.

Method in Teaching.—All sciences as they progress tend to grow deductive, that is to say, deduction plays a larger and larger part in them. This is illustrated in the growing application of mathematics or the science of quantity to the physical sciences, chemistry, etc. Here the laws reached by induction are set forth at the outset as the first principles of the science, from which the explanation of particular phenomena is deduced. In these cases, then, we see the proper order of expounding a subject, when the knowledge of it is complete, deviates from the natural order of arriving at knowledge by the individual mind when left to itself. In other words, the "method of instruction" is not necessarily the same as the "method of discovery." * Since the teacher represents the results of all past investigations, he may start with the principles reached last of all in the actual history of human discovery, and set forth the consequence of these. At the same time, the natural order of discovery ought never to be lost sight of. In some cases, as in teaching the rules of grammar, it may be desirable to proceed according to an "inductive method," i. e., leading the pupil up from an inspection of words in actual use to a comprehension of the laws that govern their use. And in no cases ought principles to be taught before *some* examples are given. It is now admitted that the elementary principles of number, or the simple propositions of arithmetic, are best taught by means of an inductive operation carried out on concrete examples of number. Not only so, even such "self-evident" truths as the axioms of geometry require, as mathematical teachers are well aware, a certain amount of concrete illustration. So obvious a principle as that if equals be added to equals the wholes are equal should be illustrated and firmly grasped by aid of concrete examples. The words of Seneca in reference to practical training apply to theoretic instruction also:

> "Longum iter est per præcepta:
> Breve et efficax per exempla."

Thus, in every case, the right method of teaching a sub-

* See Jevons's "Elementary Lessons in Logic," lesson xxiv.

ject proceeds to some extent according to the order of discovery.

The full consideration of the subject of method does not belong here. The broad distinction between induction and deduction only enables us to deal with it in part. Another important logical distinction bearing on the problem is that of analysis and synthesis. In the first we set out with the complex and resolve it into its simpler parts; in the second we reverse the problem, and, starting with the simple, build up the complex. The distinction is to some extent parallel to that between induction and deduction. In observing facts and arriving at the common principles that underlie them, we resort to analysis. On the other hand, in reasoning deductively, as in Euclid, we proceed synthetically by combining elementary facts and principles. There is often a choice between proceeding analytically or synthetically, e. g., in teaching a new language.

Closely connected with the subject of method, or the best way of teaching a single subject, is that of the best order of dealing with the different subjects of teaching. This is broadly determined by psychological principles, the laws of the growth of faculty. Psychology tells us that subjects appealing mainly to memory and imagination (e. g., geography and history) should precede subjects exercising the reasoning powers (mathematics, physical science). This fixes what has been called the psychological order. But within these broad limits the special arrangement to be followed has to be determined by logical considerations. That is to say, we have to consider the relative simplicity of the subjects, and the dependence of one subject on another. This gives us the logical order. By such considerations we arrive, for example, at the rule, that some knowledge of mathematics must precede the study of physics; that some knowledge of mechanics, chemistry, etc., must precede the study of physiology (see Appendix C).

APPENDIX.

The first manifestations of the reasoning faculty are illustrated by Perez, *op. cit.*, chap. x, and Egger, *op. cit.*, part iv.

On the training of the faculty of judging and reasoning, the student should read Locke's little work, "Conduct of the Understanding" (ed. by Prof. T. Fowler); Miss Edgeworth, "Practical Education," chap. xxiii. He should further master the elements of deductive and inductive logic as expounded in such a work as Prof. Jevons's "Elementary Lessons."

CHAPTER XVI.

THE FEELINGS: NATURE OF FEELING.

Having now briefly reviewed the growth of intellect, we may pass on to trace the second great phase of mental development, the growth of the feelings.

Feeling defined.—The term "feeling" marks off those mental states which are pleasurable or painful. These may be immediately connected with bodily conditions, as the sensations of hunger, or may accompany some form of mental activity, as the emotions of hope or remorse. While all feeling has the characteristic of being pleasurable or painful, agreeable or disagreeable, in some degree, there are many feelings which are of a mixed character, such as the bodily feeling of tickling and the mental feeling of grief at the loss of a friend. Feelings exhibit all degrees of intensity, from the quiet current of satisfaction which attends the consciousness of doing right, up to the violent excitement of a transporting joy.

The feelings constitute a distinct, well-marked phase or division of mind. Our pleasures and pains make up the *interesting* side of our experience. The objects of the external world only have a value for us in so far as they affect our sensibilities or touch our feelings. Since the feelings are the elements of happiness and its opposite, the study of them is an important part of the science of well-being.

But feeling is not merely a subject of great importance in itself: it stands in certain relations to the other two sides of mind. On the one side, it is connected with the exercise and development of the intellect. Although feeling, in its more violent forms, opposes itself to intellectual activity, in its more moderate degrees it supplies the interest which quickens and rouses the faculties. The culture of intelligence is accordingly limited by the development of the feelings. Conversely, the cultivation of the intellect promotes the growth of all the higher and more refined feelings, as the sense of beauty, truth, etc. In this way the development of knowing and feeling are closely connected and intertwined.

On the other side, feeling stands in intimate connection with action and will. It supplies the stimulus or motive force which excites the will to action. The incentives or motives which urge us to do things are the immediate products of the several emotional sensibilities. The habitual directions of conduct follow the lead of the dominant feelings.

The Diffusion and Effects of Feeling.—Every feeling is a mode of mental excitement, and as such has a certain tendency to persist and to master the mind. All our stronger feelings, when fully excited, have a gradual rise and subsidence, the stages of which we can easily trace. A child carried away by hilarious excitement or angry passion shows this course of gradual rise and fall, expansion and contraction. When the current of feeling is thus allowed to rise and swell, as in all forms of passionate excitement, well-marked effects, both mental and bodily, are observable. Strong and violent feeling agitates the mind, weakens and often paralyzes the power of voluntary or selective attention, and disturbs the normal flow of the thoughts. Thus a child in a passion of grief or anger is overwhelmed with the agitation, and unable to reflect and to judge. The force of the emotional excitement keeps whatever ideas are congruous with the feeling and fitted to sustain it vividly before the mind, and excludes others. Thus the mind of the angry child is dominated by the idea of some real or fancied injury, and can not view impartially all the facts of the case. And even less agitating forms of feeling show the same effect on the mind in a less striking degree, by causing it to dwell too much on certain aspects of a subject, and so to form a one-sided and biased view of the matter.

The clear understanding of this effect of feeling in warping the intellectual mechanism is of the greatest consequence to the teacher. Illustrations of it have already been given in connection with the training of the imagination and of the judgment. The teacher who aims at freeing the child's mind from prejudice, and rendering its intellectual processes orderly and steady, must be on the watch for this disturbing action of the insidious forces of emotion. Even good feelings, as pity for one in adversity, if allowed to gain the ascendancy in the mind, are apt to obscure the intellectual vision. The well-known effect of strong commiseration for an individual in rendering persons unjust in their judgments is explained by this circumstance. The excessive indulgence in compassion unduly narrows the field of mental vision, shutting out from view much that is relevant and necessary to a fair estimate of the action as a whole.

Along with these mental disturbances, there are important physical or bodily effects of feeling. The close connection between mind and body is nowhere more plainly illustrated than in the immediate physical effects of states of feeling. All emotional excitement radiates, so to speak, over the organism, bringing about great changes in the vital processes (action of the heart, respiration, etc.), and throwing the muscles into violent activity. A severe shock, whether of grief or of joy, has been known to produce serious physical results; from all which it is evident that the due control and repression of violent feeling of all kinds is a matter of great educational importance, as well in the interests of the child's physical well-being as in those of his moral well-being.

In addition to these physical accompaniments of violent feeling or passion, there are the characteristic bodily accompaniments of our ordinary feelings, including those external manifestations which are commonly called expression, facial movements, gestures, modifications of vocal utterance, changes in circulation leading to pallor, and so on. Pleasure and pain have their distinct manifestations, as the look of joy, the elated attitude of body, and the look of sadness and depression. And the same applies to some extent to the several kinds of pleasurable or painful feeling, as anger, fear, and love. So close is this connection between the feeling and its bodily manifestation that the adoption of the external signs of an emotion (look, gesture, etc.) may often suffice to induce a certain strength of the corresponding feeling. This is illustrated in the workings of sympathy, which appears to begin with the imitation of the external signs of feeling, e. g., the facial signs and vocal effects of grief.

The understanding of the bodily manifestations of feeling is of great educational importance. Children may to some extent be encouraged to adopt a feeling by assuming its external expression. On the other hand, a feeling may often be repressed, partially or entirely, by controlling its bodily manifestations.

Further, the ability to read and interpret the effects and expression of feeling is of great importance for the accurate observation of the emotions of children. The feelings of the young, who, as a rule, not having yet learned the art of self-control and disguise, are very frank in expressing their emotional states, can be very fairly estimated by means of their external manifestations. By such observation we may readily compare one child with another in respect of the intensity of a particular feeling, say pity, or remorse, or may inquire into more general differences, as liveliness and quickness of emotion as a whole. By such means we may gain a clearer insight into the peculiarities of a child's emotional temperament, and so be in a much better position to deal with it for intellectual and moral purposes.

Pleasure and Pain.—The two strongly contrasted modes of feeling, pleasure and pain, have their conditions or causes, the knowledge of which is of great importance, both by way of securing the happiness of the young, and of working on their active impulses.

Pleasure is the accompaniment of the moderate and suitable activity of some organ or faculty of the mind. Moderate stimulation of the palate, of the higher senses, of the muscular energies, and of the mental faculties, is attended by a sense of enjoyment.

When, however, the stimulation passes a certain limit, the pleasurable effect diminishes and rapidly passes into a distinctly painful effect. Thus, when the light of the rising sun exceeds a certain intensity, the eye is fatigued or "blinded"; similarly, violent muscular exercise or a severe strain of the mental powers is disagreeable and fatiguing.

Again, pain may be occasioned by the want of an appropriate stimulus. Examples of this are to be found in the restlessness and uneasiness of an active boy who can not indulge in muscular activity, and in the mental condition known as tedium, *ennui*, dullness, which is induced by the absence of wholesome mental occupation. In a somewhat similar way pain is occasioned by all obstructions to activity. A feeling of inability to lift a weight or find a reason for a thing is disagreeable.

It appears to follow that pleasurable activity lies between two extremes, excessive or strained exercise on the one hand, and defective or impeded exercise on the other.

The terms moderate, excessive, and defective are here relative to the natural strength and the acquired habits of the organ or faculty. A boy with well-developed muscles needs more exercise than another. So a strong and active brain requires more to think about.

Effects of Pleasure and Pain.—The suitable and moderate activity of an organ is beneficial to that organ and furthers its permanent efficiency. On the other hand, unsuitable and excessive activity injures the organ and impairs its future efficiency. We may say, then, that pleasure furthers, whereas pain obstructs, a healthy, efficient state of the organ concerned. Not only so, since the several organs of the body stand in the closest relation one to another, the state of any one necessarily affects that of the others. As pointed out in an earlier chapter, the over-stimulation of the brain tends to impair the functions of the bodily organs. On the other hand, a flow of happy mental activity conduces to the perfect discharge of these functions. In this way all pleasurable states, when not carried to the point of boisterous and exhausting excitement, have an exhilarating effect on the whole organism, expediting the processes of digestion, respiration, and so forth. And conversely, painful states have a depressing and lowering effect on the organism as a whole. Intense grief or terror involves a hurtful drain on the nervous energies, impeding the action of the heart, etc., and diminishing muscular power.

The educational bearings of these principles are apparent. The ends of intellectual training dictate the same rule as those of humanitarianism: Make school-work as pleasant as possible. The best kind of intellectual activity is that attended by a flow of pleasurable emotion. Such pleasure is at once a sign that the activity is normal and right, and a guarantee of prolonged and fruitful activity. One of the greatest gains of modern educational reform is the clear enunciation of the principle that learning, in the true and complete sense, is only possible when the sense of irksomeness and drudgery gives place to a pleasant consciousness of free and natural movement.

This rule does not mean that the teacher should be always aiming at the more intense forms of delight. Such an end is unattainable, and is moreover undesirable. Moderate and quiet enjoyment is that which best comports with the calm mental attitude of thinking. Nor does the rule exclude all that is disagreeable. The learner must encounter difficulties, and it is well that he should. The occasional sense of a teasing difficulty, of foolish negligence, and so forth, is needed to screw up the faculties to their highest degree of tension. But such occasional rebuffs need not interfere with the general pleasurableness of study. So far from this, the very temporary annoyance may, by becoming the starting-point for a fuller exertion of the mental powers, subserve a deeper enjoyment in the end.[31]

Monotony and Change.—Our feelings of pleasure and pain are governed by the law of change or contrast of mental state already referred to. A cause of pleasure, if it remains unchanged, tends to lose its effect. Prolonged bodily activity loses the first delightful sense of freshness. On the other hand, change of activity is a known cause of enjoyment. *Variatio delectat.* The transition from the school-room to the play-ground, from the holidays to the work of the school, from town to country, and so on, is exhilarating. The delights of novelty are only a more striking illustration of the same principle.

A like result shows itself in the case of prolonged causes of pain. A patient suffers less from prolonged bodily pain (supposing the cause not to increase), and we all suffer less from enduring worries and troubles when we "get used" to them. What is known as the deadening of the more delicate modes of sensibility illustrates the same principle. Thus a child's sense of shame is dulled by a too frequent wounding of the feeling by humiliating words, ridicule, etc. The horror at the sight of pain, death, etc., is blunted by familiarity. As Hamlet says, *à propos* of the grave-digger who sings over his work: "The hand of little employment hath the daintier sense."

Accommodation to Surroundings.—The effect of prolonging the causes of pleasure and pain in diminishing the intensity of the feeling evidently implies a change in the condition of the organ concerned. There is a process of adjustment or accommodation of the organism to its surroundings.

A striking example of this power of self-adjustment is seen in the fact that a stimulus which at first is distinctly disagreeable may in time become not only indifferent but positively pleasurable. This is illustrated in the acquired likings of the palate, the fondness for alcoholic drinks, bitter condiments, and so on. Another illustration is seen in the effects of exercising an organ or faculty. The growth that results from a regular periodic exercise of muscle or brain implies an accommodation of the organ to a greater strength of stimulus, so that an amount of exercise which was at first excessive and painful becomes enjoyable.

One other effect of the prolongation or frequent renewal of stimulation remains to be touched on. What is customary, though it loses the first fresh charm, becomes endeared by habit, so that when deprived of it we suffer. It is owing to this principle that a child is fixed in certain definite lines of bodily and mental activity. He finds a quiet satisfaction in going through the round of tasks, etc., he is accustomed to, and resents any interruption of the customary order.

The craving for change and the clinging to what is customary are the two great opposed principles of our emotional experience. A certain amount of variety and novelty is necessary to prolonged enjoyment. Yet if the change from the old to the new is great and abrupt there arises the painful sense of loss. In early life the law of change is the dominant one. Children delight in new impressions, and crave for the excitement of change. As a rule, too, they soon forget old friends and surroundings, and know little of longings for what is past. This means that they are in the plastic state of youth, in which the mind easily adapts itself to the new, and is but little bound by the ties of habit. But the love of change in its more intense form is a mark of a particular temperament, and children exhibit considerable differences in this respect. Timid, clinging natures much more readily attach themselves to their customary surroundings, and feel a new environment to be strange and discordant. As a rule, boys with their active adventurous nature are more under the dominion of novelty than girls.

The principles of change and habituation in relation to the feelings have important educational applications. A recent writer has said that "monotony is the greatest enemy a teacher has to deal with." * However this be, it is certain that the most effective way to divest learning of all irksomeness is to introduce as much novelty and variety as possible, both in the materials presented and in the manner of presenting them. At the same time, the teacher can not be always opening up new and agreeable vistas. He must resort to repetition for the sake of thoroughness of apprehension and firmness of retention. He may even be justified in certain cases in persevering with what is distasteful to a child if there is reasonable ground to hope that the learner will, by a process of accommodation and growth, find the subject congenial by-and-by. It is only in the earlier stages of instruction that the pleasure of novelty can be frequently indulged in. The aim of the teacher is to develop fixed or permanent interests, that is to say, to direct the emotional energies into habitual chan-

* "Theory and Practice of Teaching," by the Rev. E. Thring, p. 189.

nels. And this, as we have seen, involves a certain loss of freshness, though this is amply compensated by the development of a strong attachment to what has grown customary, and become in a sense a necessary part of our existence.

Varieties of Pleasure and Pain.—The feelings of pleasure and pain fall into two main groups: (1) those arising from nervous stimulation, and (2) those depending on some form of *mental* activity. The first, commonly known as "sensations," may be called sense-feelings; the second are best distinguished as emotions.

(A) Sense-Feelings.—These, again, fall into two distinct groups: (*a*) those connected with the state of the vital organs, or the organic sense-feelings; and (*b*) those arising from the exercise of the organs of special sense and the muscles.

The first group, being connected with the discharge of the lower vegetal functions, are the first to manifest themselves in the development of the child. The infant is subject to a number of disturbances of the functions of digestion, circulation, etc., and these disturbances may give rise to a considerable amount of suffering. Attention to these signs of impeded function forms an important part of early physical education. Owing, too, to the close connection of body and mind, these states of physical comfort and discomfort profoundly affect the temper and mental tone of the child. A child suffering from indigestion, cold, and so forth, is predisposed to be cross and ill-manageable. Indeed, such organic evils when neglected may, by inducing a chronic irritability, foster the germs of bad emotional traits, such as fretfulness and quarrelsomeness.

The pleasures and pains connected with the activity of the sense-organs are of a higher order, and show themselves later in the history of the child. The delight of color and of sweet sound marks the growth of the higher animal and distinctly human functions. We only see a crude trace of it in the first months of life; its fuller development presupposes a measure of intellectual activity, viz., discrimination, and belongs to a much later period. Finally, the feelings connected with the activity of the muscles presuppose a certain development of the organs and a certain command of them by the will. The infant obtains only a limited enjoyment from the use of his motor organs. It is later on, when he grows stronger, can run about and perform a variety of actions, that he realizes the fuller delights of muscular activity.* [32]

(B) The Emotions.—The higher feelings or emotions, again, fall into certain well-marked varieties of pleasurable and painful susceptibility, such as the satisfactions and correlative dissatisfactions of self-esteem, affection, the moral sense. These, like the sense-feelings, may be best considered in the order in which they manifest themselves. But before taking them up in detail we will consider the general laws according to which the emotions develop.†

Development of Emotion.—The same general laws of mental development which we have found to hold good in the case of the intellectual faculties apply also to the emotions. These are deepened and fixed by exercise, or, as we commonly express it, indulgence; and there is a progress from feelings simple in their composition, involving little mental representation, to feelings complex in their nature, and implying a high degree of representative activity.

* When speaking of the organic feelings, we have to dwell on the painful or disagreeable side as being the more conspicuous. In the feelings connected with the use of the senses, especially hearing and sight, the pleasurable side is the more prominent.

† In most cases it is the pleasurable side of the feeling or susceptibility which is specially indicated by the name, as when we speak of the love of approbation or of self-complacency. In the case of fear, however, we clearly have to do with a painful feeling.

(1) *Instinctive and Hereditary Element.*—Our emotions spring out of certain instinctive germs. The child is so constituted as to be affected with the particular feeling called anger or fear when the appropriate circumstances, sense of being thwarted, consciousness of danger, present themselves. And this instinctive rudiment of emotion is not the same in all cases. We find that similar circumstances and experiences do not result in the same intensity of emotion in different children; and this shows that they are born with dissimilar emotional tendencies or dispositions. The sum of these native or instinctive dispositions constitutes the child's emotional nature or temperament. Such differences in emotional capacity are connected with physical differences, including diversities not only in the structure and mode of working of the brain and nervous system, but in the constitution of the muscular system and of the vital organs engaged in the outgoings of feeling.

The instinctive foundations of feeling include, besides these capacities to feel in different ways, certain *transmitted associations.* For example, the infant smiles, when only a few weeks old, at the sight of his mother's face. This implies that there is an inherited tendency to feel pleasure of a particular kind in connection with this particular impression, viz., the sight of the human face. Again, there is good reason to suppose that the child has an instinctive fear of strange men, and of certain animals. Such transmitted associations appear to point to the effects of ancestral experience. Numberless experiences of the pleasures of human companionship, and of the dangers connected with strangers and wild animals during the past history of the race, have left their organic trace in the shape of an inherited association.

(2) *The Effect of Exercise, Experience, etc.*—In the second place, every emotion in its developed form presupposes certain experiences and a process of acquisition within the individual life. The feelings, like the intellect-

ual operations, become strengthened and perfected by exercise of the natural capabilities.

Every experience of pleasure or pain leaves its after-trace on the mind. Just as every exercise of the powers of attention leaves the mind and the connected brain-centers modified and more strongly disposed to that particular kind of activity, so every indulgence of a feeling tends to strengthen the corresponding disposition. The child that has fully indulged a feeling of anger or of vanity is much more ready to fall into that mode of feeling again.

It follows from this effect of exercise that every feeling tends (within certain limits) to become deeper by repeated indulgences. Traces of previous feelings of a like kind mingle with the new feeling; or the new feeling wakens echoes of previous like feelings. In this way, for example, a child's feeling of gratitude toward one who is in the habit of being kind to him is gradually deepened by an accumulation of emotional traces.

As a final result of this persistence of emotional traces we have what is called revived or "ideal" feeling. After having had actual experience of fear or anger, a child is able, when his representative power is sufficiently developed, to recall and imagine the feeling. Thus he can recall a fit of anger, and can imagine himself feeling angry again by supposing himself in new circumstances, and can enter into another's feeling of anger when he sees it expressed. This ability to reproduce and realize a state of feeling, when no longer actually present, constitutes a most important attainment in emotional and moral development.

Association of Feeling.—This revival or representation of feeling takes place according to the law of contiguity. A feeling of pleasure or of pain is recalled to the mind by the recurrence of the impression or object of which the feeling was an accompaniment. Thus, to take a simple case, the sight of a cool stream on a hot day calls up the pleasurable experience of a plunge. The presence of a person who has done us a kindness gives us pleasure by calling up in our mind the agreeable recollection of this kindness.* These associations embrace not only the objects and circumstances which cause the feeling, but collateral accompaniments. Thus a child may take a violent repugnance to a room or a house where it has had a disagreeable experience. A liking for a person may take its rise in some quite accidental association with a very agreeable experience.

The growth of emotion depends on the readiness with which such associations are formed, and the strength of these associations. Children of a lively emotional temperament are quick in investing places, objects, and persons with agreeable and disagreeable associations, and, as a consequence, easily acquire strong likings and dislikes.[33]

Many emotions in their fully-developed form are composite feelings, made up of many simpler feelings, both sense-feelings and simpler emotional states, which coalesce in a mass of feeling. Such coalescence takes place by the aid of association. It is the result of a number of agreeable or disagreeable associations successively attaching themselves to one and the same object. In this way arise the child's permanent likings for his favorite toys and books, his home surroundings, the streams and woods which are his frequent resort, and his brute and human companions. The more numerous and varied the experiences which combine in these associations, the greater the volume of the resulting feeling.

Habits of Feeling.—The highest result of these processes of association is the formation of a permanent habit of feeling. A child who has contracted a strong liking or disliking for a person or a place can not see or think about

* The reader should compare this with what was said in chapter ix on the effect of feeling in fixing impressions on the mind. A feeling associated with an impression strengthens this, and conversely is itself revived by its medium.

the object without experiencing a revival of the feeling. In this way are developed customary or habitual modes of feeling toward the various objects of his surroundings. The formation of these fixed habits or dispositions constitutes one important part of emotional development.

The formation of these fixed habits involves a loss of the early intensity, and a growth in respect of calmness and depth. Children's feelings are strong and explosive; feelings of older people are calmer, but more lasting. This illustrates the effect of custom touched on just now. At the same time, the growth of an emotional habit implies a large increase of *potential* intensity. Thus the calmer and riper love of a boy of fifteen for his mother includes a much higher capacity of feeling strongly when occasion calls for it, e. g., when meeting her after an interval of separation, or receiving some unlooked-for kindness from her. The effect of repetition and custom shows itself, too, in the growth of periodic cravings for the beloved object, and in a greatly intensified susceptibility to the sufferings of losing the valued possession.

Order of Development of the Emotions.—The various emotions, like the intellectual faculties, appear to unfold themselves in the order of increasing complexity and representativeness. Thus the feeling of fear comes among the earliest, because it is simple in its composition, and involves a lower degree of representative power. All that is needed to develop a feeling of dread is a physical suffering and a degree of retentiveness sufficient to build up an association of this with an object or place. A feeling of affection for a person comes later than this, because it involves a greater complexity of experience and a higher degree of retentive power.

We may, for our present purpose, conveniently divide the emotions into three classes, answering roughly to three grades of complexity: (1) The first group are the so-called egoistic feelings. As the name suggests, they have to do with the individual, his wants, interests, and well-being. They all have a common root in the instinct of self-preservation and self-furtherance. Being of the greatest consequence for the maintenance of the individual life, they are the first to be developed. They include the well-known feelings, fear, anger, love of power, and so forth Some of them, as anger and envy, are directed toward others, and, since they serve to divide individuals one from another in an attitude of antagonism, are known as anti-social feelings.

(2) The second group consists of the social feelings. These, as the name suggests, have the general character of being favorable to others, and so subserve human companionship and friendship. Hence they have a higher moral value than the egoistic feelings. Being unconnected with the instinct of self-preservation, and serving rather to check the action of this, they manifest themselves later in the history of the child. These feelings include a number of emotions of very unequal value, from a liking for another's approving smile up to a perfectly disinterested sympathy, and from a restricted and largely egoistic love for a parent up to a wide-spreading emotion of benevolence.

(3) The third group consists of highly complex feelings, which are commonly known as sentiments, such as patriotism, the feeling for nature, for humanity. These are commonly brought under three heads: the intellectual sentiment, or the love of truth; the æsthetic sentiment, or admiration of the beautiful; and the moral sentiment, or reverence for duty. These emotions in their developed form attach themselves to certain abstract ideas—truth, beauty, moral goodness. Hence they presuppose a much higher stage of mental development than the other two groups. Their culture forms the last and crowning phase of the education of the emotions.

Characteristics of Children's Feelings.—The feelings of early life are, as already hinted, to a large extent egoistic. The germ of affection may be detected, but this has little of a disinterested character. And though the rudiment of æsthetic taste is present, this is confined to the sensuous side of things (brightness, color, etc.). At the beginning of life the bodily pleasures and pains make up the chief part of the experience of feeling. Among these must be included the pleasures and pains of appetite, which form so conspicuous an ingredient in the early experience of feeling. Even those traces of emotion properly so called which appear at this time are closely allied to these lower sense-feelings. Thus temper is at first the immediate outcome of physical pain, envy the outcome of greediness, and so forth. In the first years of life feeling is bound up with the bodily life and the lower forms of sensation.

Another characteristic closely connected with this is that the emotional states of the child are immediately dependent on actual impressions. Fear is excited by the sight of a dog, but not yet by a mental image of it. In other words, the child's emotions are only directly excited by present objects. The low degree of representative or imaginative power does not allow as yet of a reproduction and ideal gratification of feeling.

This predominance of the physical element and the control of feeling by present circumstances may help us to understand other characteristics of childish feeling. Its most striking feature is its intensity and violence. We commonly talk about the passionateness of children. The outbreaks of childish temper are in their stormy violence and their complete mastery of the mind unlike anything that occurs in later life—at least in the case of those who have learned to govern their passions. This turbulence of emotion, which produces the most marked effects on the mind and body alike, is connected with the absence of reflected power. The physical discomfort is all-absorbing while it lasts, because the child is unable to bring memory and reflection to his aid, so as to recognize the triviality of the cause, the fugitive nature of the pain, and so forth. Similarly, the sight of a dog fills the mind of a timid child with terror for the time, because the mind is unable to recollect and reflect. And while the subjugation of the mind by feeling is thus favored by the intellectual weakness of the child and his low degree of representative power, it is also furthered by the backwardness of his moral development, the want of a sense of the unseemliness and mischievousness of immoderate passion, and the want of the power of will needed to check and curb the forces of emotion.

With this violence of childish feeling there is correlated another characteristic, viz., its fugitiveness. The passionate child differs from the passionate man in the transitoriness of his outbreaks. This is their redeeming side. There is something almost amusing in watching the storm of passion suddenly stilled by the suggestion of some divergent train of ideas. The little sufferer who has been thrown into an agony of distress by the accidental breakage of a toy is at once restored to his usual serenity and cheerfulness by the introduction of some new and diverting object.

This outwardness of feeling or dependence on present external circumstances shows itself further in the characteristic changeableness and capriciousness of children's emotions. The child has but few fixed likings or antipathies. To-day he is full of caresses for his nurse or his toy-animal; to-morrow he varies his mood and heaps abuse on his favorite. The annoyance of the present moment is not supplemented and counterbalanced by the remembered gratifications of the past. Each feeling is thus the result of the present circumstances and experience: it does not gather up the results of many successive experiences.

The Education of the Feelings.—The cultivation and management of the feelings forms a large and important part of education. Viewed in one way, this education of the feelings has as its object the child's own happiness. From this point of view the special object would be so to regulate the feelings of the young as to provide them with the richest and most varied means of happiness. This aim again culminates in the cultivation of the mind as a whole, and the development of intellectual interests and æsthetic taste. And this direction of emotional culture connects itself very closely with intellectual education. Finally, the educator may consider the feelings rather from a practical and ethical point of view as providing the motives or springs of action. And here his special aim will be to convert emotional force into the best stimulus to the will, so as to render the child efficient in the discharge of the duties of life. This practical view, while including a reference to the individual child's own happiness, is more specially concerned with the claims of others and the obligations of the individual to the community. It connects itself closely with the ends of moral training.

When we speak of the educator aiding in the development of the feelings, we imply that the emotional sensibilities of the individual are to some extent acted on by his social environment. This may not at first sight seem evident. The means of stimulating the intellectual powers of the child lie in the parent's or teacher's hand. He can set objects before his eye, communicate knowledge by means of words, and so directly act upon his faculties. But how is he to work on the feelings of the child? how, for example, excite a feeling of pity or of shame in the breast of a child? Yet observation shows that children's feelings are to a considerable extent under the control of those with whom they live; and we have to inquire into the means by which this influence is excited.

The culture of the emotions falls into two well-marked divisions: (*a*) the negative culture, or the due limitation of the forces of passion; and (*b*) the positive culture, or the calling forth and developing of the feelings.

(a) Repression of Feeling.—There are emotions which are apt to exist in excess, such as fear and the anti-social feelings. These must to a certain extent be repressed, whether for the child's physical or moral good, or in the interests of others. In truth, one great aim of the educator is to bring the turbulence of children's feelings under restraint.

The problem of subduing the force of feeling in the young is in some respects a peculiarly difficult one. As we have seen, their passionate outbursts are marked by great violence, and this makes it difficult for the educator to reach and influence the child's mind when under the sway of emotion. Moreover, the great agency by which, as we shall see by-and-by, the force of feeling is checked and counteracted, namely, an effort of self-restraint, can not be relied on in the case of young children, owing to the feebleness of their wills. At the same time, the mobility of the child's mind is favorable to the diversion of his attention from the exciting cause of the passion, and in this way it is in ordinary cases easy for the educator to quiet the turbulence of passion after its first violence is over.

In addition to thus seeking to subdue the force of passion when actually excited, the wise teacher will aim at weakening the underlying sensibilities. In the matter of the feelings it is emphatically true that prevention is better than cure. Thus he has to take care that children with a strong disposition to violent temper should not be exposed to circumstances likely to inflame their passion. An envious child ought not to be placed in a situation which is pretty certain to excite this feeling. An emotional susceptibility may to some extent be weakened and even "starved out" through want of exercise.

Again, feelings may be weakened by strengthening the intellectual side of the child's mind, adding to his knowledge, and exercising his powers of reflection and judgment. In this way, for example, children's first foolish terrors will be undermined by the gradual melting away of childish superstitions under the general influence of a truer knowledge of Nature and her laws. Similarly, the violence of grief is tempered by the development of the faculty of judgment, and the ability to compare things and view them in their real proportions.

Finally, the weakening or deadening of an unlovely or injurious feeling is best effected by strengthening some opposed type of feeling. Thus every exercise of a feeling of regard for others' good qualities tends to enfeeble a child's conceit. Every exercise in kindness and consideration for others helps to weaken the impulses of anger and envy. The educator, as Waitz remarks, aims at curbing and weakening the lower egoistic feelings by developing the higher social and moral sentiments.

(b) Stimulation of Emotion.—What we call the culture of feeling is, however, largely concerned with the problem of strengthening and developing certain emotions. This applies in a special manner to the higher feelings, viz., the social feelings and the abstract sentiments. The formation of the higher interests, intellectual and æsthetic, and the development of good feelings toward others, and a sense of duty, implies that the educator set himself directly to excite and call forth feeling.* Since feeling grows by exercise, the educator must use means to call forth the particular emotional susceptibility into full

* Waitz argues well against the idea (originating in Rousseau's general conception of education) that the educator's function in relation to the feelings is merely to restrain and not to stimulate. He points out that while repression is the main thing in the earlier stages of development, stimulation becomes more and more important as the child advances. ("Allgemeine Paedagogik," pp. 146–147.)

and vigorous play. There are two principal agencies of which the educator can avail himself here. (1) First of all, the child may be introduced to objects or circumstances which are fitted to excite a particular feeling. Thus, by presenting to a child some instance of suffering, the parent aims at directly evoking a feeling of pity. In a similar way, pretty objects, stories, etc., serve to call forth the feeling of æsthetic admiration. As supplementary to this presentation of suitable objects, the educator may, by inducing the child to put forth his activities, set him in the way of acquiring new experiences for himself, and so of discovering new modes of pleasure. In this manner an indolent, unambitious child may be roused to activity by a first taste of the pleasures of success and the delight of well-earned commendation. All intellectual training aims at developing certain feelings or interests by calling forth corresponding modes of mental activity.

(2) In the second place, much may be done by the habitual manifestation of a particular feeling by those who constitute the child's social environments. Children tend to reflect the feelings they see expressed by their parents, teachers, and young companions. The explanation of this process of emotional imitation will be supplied when we come to deal with the subject of sympathy. Here it is enough to refer to it as one of the great instrumentalities by which the educator may help to mold the growing emotional nature of the child.

The aim of the educator in developing the feelings should be to build up strong and permanent attachments or affections for worthy things, persons, and modes of activity. And here the principles of repetition and association become important. The feeling for the home, for the school, for the teacher, and for school-work is highly composite, the product of a slow process of accumulation and growth. If the educator wants to develop a strong liking for a subject of study, he must manage to present it in a pleasurable light, to connect it by as many associations as possible with what is agreeable. Similarly, in seeking to excite a permanent feeling of affection for himself, he has to build up a mass of agreeable feeling. He should remember, too, that even accidental associations exert a powerful influence, and seek as far as possible to make all the surroundings and accompaniments of what is to be esteemed or admired worthy and impressive.

In order to help in building up such a lasting affection, the educator must be on his guard against a too frequent indulgence of feeling on the one hand, and a too frequent wounding of the susceptibility on the other. A boy who is continually being caressed by his mother or praised by his teacher is apt to set little store by these things. No feeling must be indulged up to the point of satiety. And, on the other hand, the educator should bear in mind that the frequent wounding of any feeling is apt to deaden it. A boy who never got praise when he felt he deserved it would tend to grow indifferent to it. Affection unrequited dies from starvation. The more delicate feelings, as shame, as Locke observes, "can not be kept and often transgressed against." *

One more general caution may be added. The educator must be on his guard against spurious sickly feelings and the mere outward affectation of feeling. The very eagerness of the parent or teacher to cultivate good feelings, and the wish of children to please, are, as Locke points out, favorable to the growth of affectation.† The educator must not try to force feelings, or, by looking out for the expression of feeling, induce children to *try* to simulate the appearance of sensibility,‡ nor must he allow

* "Thoughts concerning Education," § 60. † *Ibid.*, § 66.

‡ "Nothing," says Miss Edgeworth, "hurts young people more than to be watched continually about their feelings, to have their countenances scrutinized, and the degrees of their sensibility measured by the surveying eye of the unmerciful spectator." ("Practical Education," chap. x.)

children's natural wish to please lead them spontaneously to an affectation of pleasing sentiments. He must be severe in discriminating a genuine and worthy feeling, say of pity or remorse, from its unworthy and sentimental imitation, and the more outward show for the inward reality; and he must not allow feeling to divorce itself from action and to lapse into mere emotional indulgence, instead of becoming efficient as a motive to conduct.

APPENDIX.

The laws of development of the feelings are touched on by Dr. Bain, "Education as a Science," chap. iii ("Culture of the Emotions"). The successive phases of emotional development in childhood and youth are described by Pfisterer, "Pæd. Psychologie," §§ 7, 18, and 34. The general aim of emotional culture and its relation to the other directions of education are treated of by Waitz, "Allgem. Pæd.," 2. Theil, 2. Ab. ("Die Gemüthsbildung"); Dittes, "Grundriss," §§ 50–55; and Compayré, "Cours de Pédagogie," leçon ix. Cf. J. S. Mill's "Inaugural Address at St. Andrews" (People's Edition), p. 42, etc.

CHAPTER XVII.

THE EGOISTIC AND SOCIAL FEELINGS.

In the previous chapter a general account was given of the nature of feeling. We may now go on to consider the feelings in detail. Here we shall follow the order of development and begin with the egoistic feelings, briefly discussing a few of the more prominent types, such as fear, anger, love of activity, with which the educator is specially concerned.

(A) Egoistic Feelings: Fear.—One of the earliest feelings to be developed is fear, the more intense degrees of which are marked off as terror. This is the simplest form of an emotion pure and simple, that is to say, a feeling which has no admixture of present sensation, but springs out of mental activity. Fear arises from the idea and anticipation of evil, and thus involves a simple act of mental representation. It presupposes a previous experience of pain in some form, and the formation of an association between this experience and its cause or accompaniment. Thus the child's proverbial dread of the fire is the natural consequent of some actual experience of its burning quality. At the same time there is good reason to suppose that certain forms of fear are aided by inherited association. Children of a certain age are apt to display fear in the presence of animals and strange persons, before their experience can have led them to connect any idea of danger with these objects. And the timidity shown by children when they begin to walk can not easily be explained as the result of individual experience.*

While experience is thus necessary, in the first place, to suggest danger, it is not necessary that a child should have had experience of the particular form of evil suggested in a given case. When once his mind has grown familiar with certain varieties of pain, the exercise of his imagination may suffice to excite fear in the presence of new and unknown evils. It is easy to excite fear in a child's mind by any suggestion of unexperienced evil, e. g., falling into water, a fact well known to a certain class of nurse-maids and others.†

In its more intense forms fear is always bound up with an *indefinite* representation of the threatening evil. Where the mind distinctly realizes the precise nature and extent of a suffering, the more striking characteristics of fear are wanting. Hence some of the most distressing forms of childish fear arise in presence of unknown and therefore immeasurable possibilities of evil, e. g., when threatened with being handed over to the policeman.[34] The agitating effect of fear is further increased by the uncertainty of the evil. It is harder to calmly face an uncertain misery than a certain one.

As a form of painful feeling, we should expect fear to have a depressing effect on the mental and bodily activities. But the peculiarity of the emotion is its unnerving and disabling character. The intellectual processes are arrested, the attention is rigidly held by the exciting ob-

* For a discussion of the question how far fear is inherited, see Perez, "First Three Years of Childhood," p. 62, etc.; Preyer, "Die Seele des Kindes," p. 104, etc. A question much disputed by educationists, from Locke downward, is whether children have an instinctive fear of the dark. Locke is positive that the fear of the dark is not instinctive. ("On Education," ed. by Quick, p. 118.)

† Hence the readiness with which fear is excited in the childish mind by a sensational or gruesome story.

ject, and the imagination is apt to be inflamed to a perilous degree. Abject terror thus deprives the mind of all power. And there is something analogous to this in the physical prostration which accompanies the state. In its extreme degrees fear may bring about serious bodily derangements.

Children are in general much disposed to this emotion. A little experience enables them to realize their special liability to evil, their bodily weakness, their ignorance, and their inability to cope with danger. And this result is furthered by their instinctive tendency to dread. A certain timidity seems to be appropriate to childhood; and it is natural to suppose that the native proneness to fear is one of the instinctive endowments that help to subserve the great end of self-preservation. This characteristic is, moreover, intimately connected with the earliest form of the social instinct, viz., the impulse to seek the society of others as a mode of security, and to depend on them for protection and guidance.*

The educator is concerned with this feeling in different ways. First of all, he has to guard children against all groundless and debasing forms of the emotion, more particularly superstitious terror and the fear of the dark. It is of the first importance, as Locke says, to avoid all suggestions which give rise to childish fright. Careless parents, by over-indulging children in sensational stories about hobgoblins and so forth, often excite a timidity in the young mind of which they are unaware.† The educator needs to watch carefully for the causes of children's fear. Children often connect ideas of danger with things as the result of accidental associations. Miss Edgeworth

* At the same time this feeling acts as a powerful check to the social feelings; more particularly it shows itself in the common timidity and shyness of children in the presence of strangers.

† Locke is very hard on nurses for putting notions of spirits and goblins into children's minds, "Thoughts," § 138.

gives as an instance the dread of a child for a drum which he first saw played by a Merry-Andrew in a mask. Children's tendency to fear must be corrected by the development of the opposite feeling of courage and self-confidence; and their wills should be exercised in a habit of courageously facing the sources of dread. In this way much of childish fear will disappear. Finally, the great remedy for abject and injurious terror is the development of intelligence, which dispels many of our early fears as purely imaginary, and enables us to measure the exact dimensions of any particular form of evil and to assign it its proper value.[35]

While the educator has thus to restrain fear and rob it of its overpowering and debasing force, he has at the same time to preserve and make use of the feeling in its milder forms. After a certain amount of experience, timidity is apt to give place to a foolish recklessness in encountering danger. In the first delightful sense of growing strength the boy is liable to exaggerate his ability to cope with danger. And here it is desirable to cultivate a certain cautiousness and apprehensiveness. And generally the educator, while discouraging excessive and harmful varieties of the emotion, as the dread of being laughed at, has to call forth and strengthen the emotion in relation to proper and worthy objects, as wrong actions and the loss of others' esteem.

Finally, the educator needs the emotion of fear as a motive force. Every governor has to work to some extent on the fear of the governed, and the teacher is no exception. Here, however, he must be careful not to excite the emotion in its unnerving and prostrating intensity. The policy of compelling by threat, if carried out to its cruel extremity, must necessarily defeat its own end. By exciting terror in children we deprive them of the power of doing the very things which we require. Where, however, the evil is definite in character, and of dimensions which can be grasped by the pupil's mind, the agitation of terror is eliminated, and the will is spurred to activity by a calm apprehension of a realizable amount of suffering.

Anger, Antipathy.—To the same class of simple primitive feelings as fear must be referred the emotion of anger. This resembles fear in the fact that it springs out of an experience of pain. But, unlike fear, it has a distinctly pleasurable ingredient. We speak of the gratification of the angry passions. The feeling of anger proper contrasts with fear in having as its accompaniment an energetic form of activity. A child in an angry passion is not prostrated and paralyzed as in the state of fear, but is thrown into a state of violent muscular action. At the same time the violence of the activity and its irregular and spasmodic character make it baneful and destructive of energy. A fit of angry temper exhausts the strength of the child.

In its simplest form, as seen in the passionate outbreak of an infant at the beginning of life, anger is the direct outcome of physical pain, and may be described as the instinctive revolt of a sentient creature against the dispensation of suffering. Later on, this crude type of feeling, in which the physical element predominates, becomes differentiated into the emotion of anger proper.* This feeling is based on a consciousness of another's action opposed to the child's own, and involves a rudimentary sense of injury. It is closely connected in its origin with the animal impulse of combat, and probably derives its energetic character from this circumstance. It thus has its root, like fear, in the instinct of self-preservation. It is the accompaniment of the outgoings of the impulse of self-defense against an adversary. And the deep pleasure which attends the indulgence of angry passion is probably

* Mr. Darwin says anger proper is distinctly manifested before the fourth month.

connected with the circumstance that the passion is the most rousing to the energies alike of body and of mind, and includes the satisfaction of the most powerful of our animal instincts.

Children are notoriously much under the dominion of this primitive passion. They resent suffering, and vent their resentment in outbreaks of impotent childish wrath, screaming, dashing things to the ground, and, in extreme cases, casting themselves in a kind of mad despair on the floor. Not being able as yet to distinguish in moments of mental agitation between intentional and unintentional injury, they are at such times wont to pour out the vials of infantile wrath on the unoffending heads of their doll, toy-horse, or any other inanimate thing which happens to cause them annoyance.

Anger shows itself in a variety of forms. In its pure form of retaliation it has as its exciting cause the perception of another's injurious action or intention. Being closely allied in its origin with the instinct of combat, it accompanies all the more exciting varieties of contest in a more or less distinct form. As a mere delight in annoying and injuring, it frequently associates itself with the love of power in its coarser and more brutal forms, and constitutes a prime ingredient in the well-known boyish type, the bully. It commonly combines with the strong destructive instincts of children in fostering that love of cruelty to animals of which they are commonly accused.* It makes its harsh voice heard in the shout of cruel boyish ridicule. In a less pleasurable and triumphant form the feeling of anger shows itself as a nascent hatred or spite in the child's envy at another's happiness, and, more par-

* According to Dr. Bain, there is an instinctive delight in the witnessing of suffering, which forms the core of the gratification of the malign passion. But Locke thinks cruelty is due to bad education. See "On Education," sec. 66.

ticularly, his jealousy at seeing another child caressed and favored.*

When it takes a firm root in the mind, anger may develop into a permanent antipathy or dislike to a person. Children show an animal-like readiness to contract such lasting dispositions to those who have (actually or apparently) done them harm or offered them offense.

As the anti-social feeling which divides man from man, the instinct of retaliation, though useful and necessary to the individual, makes a heavy demand on the restraining forces of the educator. It would clearly be fatal to the happiness and the moral development of the child to humor its temper and to allow its outbreaks of angry passion to go unchecked. The brute-like violence of infantile temper must be assuaged. But this can not be done by a mere employment of physical force. When, to take Rousseau's example, the nurse beats a child for crying, the discipline is not likely to calm its passion or cure its irritability.

The passionate child must be appealed to on its human and reasonable side. Thus all provocatives of violent passion must be avoided. The parent must not, for example, madden an irascible child by exciting its envy. Having himself to occasion a considerable amount of annoyance by the restraints of discipline, he must take particular pains to allay vindictive feelings in relation to himself. To this end he should avoid every appearance of irregularity, caprice, and unfairness in his mode of management. The sense of right is based on custom, and a child that is customarily allowed an indulgence smarts under a nascent sense of injustice when this is withheld. Thus a mother who in nine cases out of ten allows a child a light on going to bed, and in the tenth instance forbids this, excites a legitimate anger, closely analogous to moral indignation.

* For an account of the feeling of jealousy as manifested by children and young animals, see Perez, *op. cit.*, p. 70, and following.

Again, the educator should call forth the child's reflective powers, and cultivate a juster and sounder view of things. As Miss Edgeworth well says, *à propos* of the management of children's temper, "you must alter the habits of thinking, you must change the view of the object, before you can alter the feelings." * Thus a cross and querulous child should be led to see that much which appears to be an intended injury to itself is not so, that playmates are apt to overlook the results of their actions, and that their parents and teachers are their friends, having their true interests at heart. And, as the child's powers develop, an appeal should be made to the will to exert itself in checking and bringing under the turbulent forces of passion. Lastly, the anti-social impulses should be limited and counterbalanced by the assiduous cultivation of the social and kindly feelings. Discipline and a growing sense of the unseemliness of violent passion may suffice to check its outbreaks; but the only adequate security against the indulgence of internal malice, hatred, and the other unholy progeny of anger, is the formation of a humane and generous disposition.

Here, too, as in other cases, the educator must remember that his function is not that of extirpating something wholly bad. The impulse of injury is a necessary endowment, and has its proper and legitimate scope. It is no doubt true that society, by taking the punishment of the more flagrant offenses into its own hands, deprives the individual of the fullest indulgence of his vindictive instincts. At the same time it is equally plain that it allows him a certain modest field for the exercise and manifestation of the retaliative impulse. No form of government, whether that of the school or of the state, relieves the individual of all necessity of self-defense. On the contrary, he is expected to assert his own rights, and to meet injury by a manifestation of those instincts which Nature

* "Practical Education," chap. vi.

has provided for our self-protection. A child that is tame and spiritless, and allows the bully to indulge his love of power to the utmost, proves himself to be unfitted to take his part in the battle of life. And such servile submission, so far from being praised by the moral educator, should if needful be denounced.

Not only so, anger is needed to give life and vigor to higher and nobler sentiments. The instinct of retaliation, so brutal and cruel when untamed, is susceptible of becoming softened and refined into a worthy feeling. In the indignant revolt of the child-mind against the very idea of cruelty, whether to man or brute, anger is not only stripped of its unloveliness, but assumes a pleasing and even admirable aspect. By cultivating a wide sympathy with the sufferings of others, the educator may help to humanize the instincts of resentment, by transforming them into a genuinely disinterested and impassioned sense of justice.[36]

Love of Activity and of Power.—We now come to a feeling of a different order, viz., the love of activity. It is egoistic, since the pleasure which the child experiences in exerting his powers is connected with and subserves the maintenance and furtherance of him as an individual. At the same time it is a feeling which the educator has rather to foster and utilize as a motive than to repress. It supplies one of the well-known educational motives.

As pointed out above, all activity, when suitable to the powers exerted, is attended with a sense of enjoyment. Where there is a vigorous body and brain, and an adequate recuperation of the powers by periods of repose, there arises a strong disposition to activity, so that the slightest opening or stimulus is seized and utilized. This readiness to act is known as the "spontaneous activity" of the child. Healthy children are eager to be doing something. And this spontaneous energy vents itself not only in muscular action, but in an exercise of the sense-organs and the brain in examining objects. The pleasure directly springing from and accompanying this discharge of nervous force constitutes the sensuous basis of the love of activity.

The feeling acquires more of the dignity of an emotion when the spontaneous activity meets with a momentary check. This excites a special exertion of energy and involves a much more distinct consciousness of the action as our own. One may easily observe the germ of this feeling in a child of two or three months when absorbed in some exciting effort, as trying to lift a heavy object or to reach one lying barely within its reach. The overcoming of the difficulty is accompanied by a look of elation and a grunt of satisfaction. Here we have the first rude trace of the emotion of power. In the intensification and prolongation of its activity under the stimulus of an obstacle the child has woke up to a clearer and fuller consciousness of its powers.

The pleasurable feeling of power is experienced whenever the child succeeds in doing something—whether a physical or mental act—that it could not do, or was not aware of being able to do, before. It is also enjoyed when any action, which was before felt to be difficult, becomes sensibly easier. It is thus connected with progress or growth, and involves a feeling which is directly satisfied by a comparison between the past and the present. The feeling of power further derives much of its gratification from the social surroundings. In the face of its elders, parents, teacher, etc., the child is no doubt conscious rather of its weakness than of its strength. And this sense of power may readily grow into a distinctly painful feeling. But children have a way of recouping themselves for any humiliation from this source by emphasizing to the utmost any superiority to other children of which they are able to boast. And, in thus asserting their superiority to others, they are apt to realize the keenest satisfaction of the feeling of power. In this mode of gratification, however, the emotion has an anti-social character. In its more exciting forms it owes much of its pungency to the admixture of an element of malignant satisfaction, whether the delight of the bully in crushing the weak, or the less ignoble rejoicing of the successful antagonist over his more equal rival.

The feeling of power is capable of growing into a permanent and habitual emotion, the agreeable consciousness of ability to do things. This is a higher form of the emotion, involving more elaborate processes of comparison and abstraction. In this permanent form it enters into what we call pride or self-respect.

The development of the love of activity and power must be checked in certain directions. Children are, as Locke observes, greedy of dominion, and desire superiority over others not only in physical and intellectual strength, but also in material possessions. The desire for power must be moderated and kept within due limits. When thus restrained, however, it becomes a most valuable incentive to exertion. A right ambition to get on, to grow in strength, knowledge, and skill, is the prime source of youthful effort.

To enjoy the sense of power, the child must, it is evident, have a certain liberty of action. The suffering of restraint is the consciousness of fettered energy. A child only does his best at anything when he enjoys a sense of spontaneous exertion and self-activity. To throw an appearance of spontaneity into school-work is the most certain means of rousing his energies to their full tension. The Kindergarten undoubtedly owes much of its popularity among children to the fact that it so easily presents itself to their minds as a sort of more serious play-room.

In the higher stages of education there seems less room for the action of this principle. Learning can not be reduced to a highly enjoyable experience of self-activity.

The very conception of teaching involves external restraint, and this excludes the full delight of spontaneous activity. Not only so, the teacher must do very much to assist the faculties of the child, and so keep him in mind of his intellectual weakness. Yet this very circumstance makes it all the more important to secure some scope for a free, enjoyable consciousness of power. The mode of instruction that humiliates the child to the utmost by discouraging his spontaneous exertion of faculty and insisting on the fact of his stupendous ignorance is as fatal to intellectual development as it is disagreeable. So far as comports with the exigencies of teaching, the faculties of the learner should be called upon in discovering things, so that he may experience that pleasurable consciousness of doing something for himself which is the most potent stimulus to exertion.

Not only so, the more the teacher by the influence of his personality takes away from the mode of instruction all appearance of restraint, and raises learning to the level of a dignified pursuit which it is a privilege and honor to follow, the more likely are the learners to throw themselves heartily into their studies. Children never have such a keen sense of growing power as when they are trusted with some new and important task. Even the least inviting kind of work has been known to grow not only palatable but actually desirable when thus invested with the semblance of responsibility and dignity.* Children should be accustomed to look on each new stadium of study as a larger privilege, a recognition of the fact that they have more power than they had, and a step onward to the full fruition of manhood's functions.[37]

* Mark Twain gives a delightfully humorous, but at the same time strikingly true, illustration of this in the way in which Tom Sawyer made the other boys eager to relieve him of the work of whitewashing the fence by pointing out that a body does not "get a chance of whitewashing a fence every day."

Finally, children should be led so far as possible to realize the advantages which intellectual development brings with it. This was touched on in connection with the training of the memory. The growing ability to converse with others, due to expanding intelligence, is itself no small gain to a child. One may often note the look of pained bewilderment on a child's face who overhears his parents discoursing of what lies too high for his young intellectual wing. Most of us can remember as one of the most delightful experiences of life the first sense of "growing up" when we were allowed to sit up in the evening and listen to the older people's book. And, in so far as the knowledge acquired at school is felt to bring the child nearer the wider and mysterious circle of adult ideas, it will acquire a new charm by gratifying his ambition. And for a similar reason every discovery of the practical utility of knowledge will serve to quicken the desire for it.

Feeling of Rivalry.—Closely connected with the feeling of activity is the emotion of rivalry. This, too, springs out of conscious activity. It is the feeling which attends the putting forth of exertion in competition with another. It is the familiar form of emotional excitement which accompanies all combat. This excitement is partly the result of the more strenuous activity which the stimulus of competition evokes. But its chief ingredient is the delight in combat, in proving our superiority to another by defeating him in some exercise of strength or skill. Its full fruition is the elation of victory.

The feeling of rivalry is one of the earliest to be developed. It has its roots in the instinct of combat, which we see clearly illustrated in the play as well as the more serious contests of children and young animals. Children are much under the sway of this feeling. Association with other children gives constant opening for the excitement of contest. And many a child that if left to itself would be comparatively inactive is roused to strenuous exertion by this stimulus.

The feeling manifests itself in a variety of forms. In some of these its anti-social character or tendency is hardly observable, whereas in other forms this is manifest. Much of children's activity has an element of competition in it, though no distinct feeling of antagonism, leave alone anger, is developed. This remark applies to many things they do under the stimulus of example and leadership. A child that tries his hand at doing something he sees another child doing is concerned rather with proving his own ability to do something than to gain a victory over a competitor. The feeling here is one of personal ambition, with the impulse of rivalry in the background. The same remark applies to much of the later activity of life.

The feeling becomes more distinct, and shows its anti-social character better in those situations of contest proper where mastery is directly aimed at. In the case of bodily combat, or fighting "in earnest," the feeling of rivalry is at its maximum intensity, being sustained and inflamed by angry passion. In more friendly contests of physical strength or skill, the feeling is purer, anger being absent. The anti-social tendency of the feeling, however, is plainly seen in the fact that triumph over competitors naturally leads on to contemptuous "crowing," while, on the other hand, the sting of defeat often secretes within it the germ of hatred. In more prolonged contests, as those of the school, we commonly observe a tendency in the competition to foster hostile feelings toward the rival. In this way all contests, as the very name suggests, approximate to the situation of hostility.

The educational treatment of this feeling is a matter of peculiar difficulty. It is so strong an incentive to mental as well as to bodily exertion, and is so directly fostered by the circumstances of the school, that the teacher can not afford to do without it. Nor should he seek to do so.

The impulse is one of the most deeply implanted and most necessary. It lies at the root of most human activity. The teacher is accordingly justified in appealing to it within certain limits.

Being an anti-social feeling, rivalry requires the educator's careful watching, lest it grow into a feeling of hostility and lasting antipathy. This applies with special force to the school, where the teaching of numbers together offers a wide scope for this feeling. The mode of teaching by assigning prizes has the great drawback that it tends to develop the impulse of rivalry in excess. A boy who gets into the way of looking at a companion as a possibly-successful claimant for the prize he covets is hardly likely to entertain very kindly feelings toward him. As Miss Edgeworth reminds us, superior knowledge is dearly acquired at the price of a malevolent disposition.*

Rivalry is a feeling to be kept in the background. Children should be encouraged to excel rather for the sake of the attainment itself than for that of taking down another. In other words, the scholar's prevailing motive should be worthy ambition, or desire to get on, rather than the distinctly anti-social impulse of rivalry. As Rousseau and others have pointed out, the teacher can further this result by his mode of apportioning praise, grounding his estimate on a comparison between what the pupil has been and what he is, and not between what he is and what somebody else is not. In addition to this, the educator should seek to counteract the tendency to the indulgence of hostile sentiments in any form of competition by developing the social feelings, and more particularly sympathy with the sorrows of another. In this way the heat of contest will be tempered, and the delight for triumph dashed by regret at the humiliation of another; the selfish feeling of rivalry will pass into the more generous sentiment of emulation.[38]

* "Practical Education," chap. x.

Love of Approbation and Self-Esteem.—We pass now to another and very different type of feeling. In what is known as the love of approbation we seem to have to do with a feeling of high moral rank, needing to be stimulated rather than to be repressed, like the feelings of fear, anger, or rivalry.

The love of approbation is a special form of the more general sentiment, love of others' good opinion and of praise. Its essential ingredient is the gratification which the mind receives from the notice, commendation, and good opinion of another. This feeling is instinctive. A child a year old may be seen going to its mother to show her something he has done, and to obtain her look and words of commendation. It has its roots in the same primal instinct out of which the other egoistic feelings spring, viz., the impulse of self-conservation and self-assertion. Praise is the sign of another's recognition of our importance or merit, and pleases us by gratifying our instinctive tendency to attach importance to ourselves. It is thus closely connected with the feeling of self-complacency and self-esteem. The instinctive desire for others' good opinion has probably been built up, or at least strengthened, by the forces of heredity. The experiences of many generations of the material advantages flowing from others' recognition and good opinion would tend to beget an inherited liking and craving for notice and commendation. Each child's experience tends, moreover, to deepen the instinctive love of approbation by showing how much his welfare depends on his winning and keeping others' favorable opinion.

The disposition to look to others for commendation is natural and appropriate to childhood. Just as the child is physically dependent, so he is intellectually and morally dependent. In early life children can not form independent judgments as to the worth of their actions. Hence they look to others and lean on their estimates. The instinct is thus of special use in early life by helping to quicken ambition at a time when the incentive of self-satisfaction is relatively feeble. As Locke has it, reputation is the proper guide and encouragement of children till they grow able to judge for themselves.

The desire for others' good opinion is, as we have seen, distinctly egoistic. At the same time it has a social side as well. For, in desiring to stand well with others, the child is paying these a certain respect. Moreover, he has to attend to what pleases them and offends them, and so is put in the way of reaching a much higher motive, viz., the desire to give pleasure to others.

This double aspect of the feeling reflects itself in the unequal dignity of its several forms. A strong craving for others' consideration and praise, without any reference to the value of the praise, is one of the most disagreeable and baneful of moral traits. It makes a child vain of what is no worthy subject of pride, as his good looks, envious of those who win more than himself, and overbearing toward those who are less fortunate. In its least discriminating and more vulgar form, thirst for popular applause and glory, it is no doubt a mighty stimulus to effort, but it enfeebles the character by inducing a habit of estimating things wholly by a reference to what others think and extol.

On the other hand, a discriminating love of others' good opinion, a strong sense of the value of certain persons' approval, is bracing and elevating. Where the desire for esteem is directed by affection and admiration, its influence is one of the highest of educational forces. The habit of constantly looking for the "Well done!" of mother or teacher is of the greatest moral value.

In appealing to this motive, the educator should temper and restrain the feeling, and keep it from becoming an unthinking greediness for mere applause or glory. He should enlighten the feeling by pointing out how much more valuable some persons' commendation is than others'. He should be careful, too, in apportioning praise, to avoid occasion for envy. Not to recognize effort, merit, where such is supposed to exist, is one of the greatest of childish sufferings. And to see another praised when the child thinks itself entitled to the sweets of commendation is an experience prolific of bitter and hostile feelings.[39]

Finally, the teacher should remember that the end of education is self-reliance and independence. While it is well for a child to go by what others say, it is not well for a youth to take the measure of his own worth altogether from others. By sifting and distinguishing whose good opinions are most valuable, a child should be gradually forming a standard for independent self-estimation. As the school-life nears its close, the habit of looking for the teacher's approval should give place to the habit of self-scrutiny and self-judgment. Self-esteem and self-satisfaction are now adequate motives.

Children vary much in respect of the two related feelings, love of praise and self-esteem. Some are much more dependent than others on external commendation. Each extreme is bad, and should be guarded against. Excessive leaning on others' estimates leads, as we have seen, to weakness of character. It leaves no room for a proper self-respect or pride, in the good sense of this term. On the other hand, nothing is more unseemly or a greater obstacle to intellectual and moral development than an excessive and obstinate self-conceit in the face of others' opinion. A priggish child, that has been indulged in forming exaggerated estimates of his importance under the baneful influence of parental "bringing out," is the most unpromising material for the educator. And one of the most valuable functions of the school with its larger community is to correct such home-bred vanity by introducing a higher and less partial standard of reputation, and making the child feel in daily collision with his equals and superiors the limits of his attainments.

Miss Edgeworth, in her excellent chapter on vanity, pride, and ambition, uses the term "vanity" for excessive dependence on others' good opinion, "pride" for the higher forms of self-complacency ("Practical Education," chap. xi). These distinctions, however, do not perfectly coincide. Vanity is sometimes far in excess of others' opinions, and sometimes approximates to a solitary and illusory persuasion of worth. Pride is the higher and more intelligent feeling, that can discriminate what is worthy from what is not, and on this account can, when necessary, brave the common and valueless opinions of the multitudes.

(B) Social Feelings: Love and Respect.—We may now pass to the group of emotions known as the social feelings. By these are meant the feelings which have others as their proper object, and which tend to bind individuals together in bonds of affection.

The feeling of love or attachment to a person is a complex emotion, containing egoistic as well as more disinterested elements. Take, for example, a child's love for his mother. At first it is little more than a reflection of the physical satisfaction and comforts that he associates with her. She is his feeder and his protector; she lavishes caresses on him, many of which are pleasant in themselves, while others are valuable as signs of a beneficent disposition. The early love of a child is thus to a large extent a fully developed "cupboard love."

A higher form of social feeling appears in what we call regard or esteem for others. This has no reference to the self, and rests on a consideration of the object in and for itself. True regard depends on a perception and appreciation of good and valuable qualities, such as wisdom, prudence, good-nature. Children are greatly impressed by the superior knowledge and skill of their parents and teachers; but the recognition of this is more apt to excite the cold feeling of awe than the warm emotion of regard.

It is only when other and likable qualities from a child's point of view combine with these, as, for example, kindly manners, graceful bearing, and so forth, that tender feeling is excited. The love of a child for his parents or for his teacher is compounded of a grateful response for personal favors, and a more disinterested element of admiration for superior excellence.

Sympathy.—The most important ingredient in the social feelings is sympathy. This word in its etymology (*συν*, with, and *παθος*, feeling) means fellow-feeling, i. e., a participation in or entering into the sorrows and joys of others. It forms the noblest ingredient in true affection, for love is tested by the desire to please. Where it exists it transforms egoistic fondness for a source of happiness to ourselves, and mere delight in what is agreeable to have near us, into affectionate concern and self-denying devotion. Sympathy is not, however, limited by the range of tender emotion. We can sympathize with the woes of those for whom we have no liking, and even of perfect strangers. In this wider and more detached form sympathy is synonymous with good feeling, kindness, and humanity.

In its earliest and simplest form sympathy is a mere tendency to reflect the feelings which the child sees expressed by others. This tendency is clearly connected with the impulse of imitation. A child illustrates this crude form of sympathy when carried away by the hilarity of a company of children, or when moved to the expression of sadness by seeing his mother dejected. This involves no distinct consciousness of another's state of mind, but is a species of automatic imitation. Children are much under the sway of this emotional contagion. The spread of a feeling of hilarity or of indignation through a play-ground illustrates the action of this force.

In its higher and fully developed form sympathy includes a distinct idea of another's sorrow or joy, and a responsive or participative feeling. A child that fully sympathizes with his mother in distress suffers in company with her. This conscious participation in another's suffering has as its active result a desire to remove the pain, just as though the child were himself overtaken with it. And it is this practical identification of ourself with another which makes the essence of all that we mean by kindness, benevolence, and self-sacrifice for others.

Sympathy commonly involves a certain amount of pain to the sympathizer. When we sympathize with another's distress we take that distress upon ourselves. Even when we enter into another's joy there is often a painful effort to suppress the promptings of envy.* But sympathy, when accompanied by a flow of tender emotion, becomes in a measure pleasurable. There is a certain delight in pitying others, as is evident from the part which commiseration plays in the drama and works of fiction. Children often prefer "very sad" stories to any others.

It is, however, to its recipient that sympathy is most distinctly pleasurable. He has his pains assuaged and his pleasures intensified by another's fellow-feeling. Hence, the desire for sympathy often exists in a perfectly selfish mind which is quite incapable of requiting it. In children the longing for sympathy is often in the inverse ratio of the ability to bestow it on others.

Sympathy seems to strengthen and fix a feeling in the mind of the recipient. A child that feels itself aggrieved has this feeling confirmed by the sympathizing words of another. It acts like a reflector, bending back, and so intensifying the rays of emotion. Our habitual feelings, our likings, tastes, antipathies, are greatly re-enforced by the sympathy of congenial minds. On the other hand, the desire to be in sympathy with others acts as a powerful

* As Jean Paul Richter observes, "in order to feel with another's pain, it is enough to be a man; to feel with another's pleasure, it is needful to be an angel."

assimilative force. In the case of friends thrown much together, sympathy is apt to produce a community of feelings and ideas.

Conditions of Sympathy.—To sympathize with another is by no means a natural and instinctive operation. It involves a difficult process, viz., an observation of the external expression of another's feeling, and an interpretation of these outer signs. For the due carrying out of this process certain conditions are necessary: (*a*) To begin with, there must be a disposition to observe and look out for the signs of others' feelings. A sympathetic mind is closely observant of others. Observation is habitually swayed and directed by a special interest in others. (*b*) Again, we can not sympathize unless we ourselves have felt, and can recall our experience. To enter into another's sorrow presupposes that we understand the expression of it, and this involves the recalling of our own sorrows. (*c*) To this memory of personal happiness and unhappiness must be united a sympathetic imagination, a readiness to feel ourselves in the place of another, and realize situations and feelings differing in some respects from anything that we have ourselves experienced.

From this bare enumeration of the chief conditions of sympathy we can understand how it is that the young are commonly so deficient in it. They want the human interest that would prompt them to observe others closely, and they are without the emotional experience necessary to the construing of the outer signs of feeling. Much of the sorrow and the joy of adult life is a sealed book to the child. Moreover, sympathy is excluded, or at least greatly narrowed, at first by the preponderance of selfish interests and occupations, and by the anti-social feelings. The promptings of antipathy, triumph, social prejudice, restrict the outgoings of pity, while envy keeps back the impulse to rejoice in the joy of others.

The germ of social feeling shows itself early in life.

A child less than two months will smile at his nurse, a fact that suggests an instinctive sociability. Imitative reflection of an expressed feeling, e. g., by depressing corners of mouth when nurse begins to cry (Darwin), may be detected by the beginning of the eighth month. A deeper and more intelligent sympathy shows itself in the second year, as pity called forth by simple forms of distress, such as hunger, cold, etc., which are easily intelligible to the child. Among the first recipients of this early childish sympathy are its pet animals. It is easy for a child to enter into the experiences of physical want and satisfaction which make up animal life. Hence, in part, the charm of animal stories for the young.* Among human beings those who are bound to the child by the ties of love and daily companionship naturally come in for the first sympathy. Fellow-feeling for outsiders is a much later development. The circle of sympathy gradually expands from the home as its center. The range of sympathy is bounded by the child's store of knowledge and the power of his imagination. Hence, culture enlarges the area of sympathy, while reciprocally the human interest which springs out of sympathy is one great motive to a study of human life and experience as unfolded in biography, history, etc.

Uses of Sympathy.—The force of sympathy is rightly looked on as one of the most valuable agencies in education. It is needed both as an aid to intellectual development, and still more as a means of moral growth.

As a stimulus to study, sympathy is a strong incentive. Here the first thing is to establish a relation of sympathy between the teacher and the pupils. In this the teacher must take the lead by showing sympathy with the child.

* I have known a child of twenty-one months burst into tears at the sight of a dead dog taken out of a pond. On the nature of sympathy with animals, see M. Perez, "First Three Years of Childhood," p. 75, and following.

He can enter into the child's experiences, but he can not as yet expect the child to understand his feelings. This calling forth of affection by showing affection is difficult, for children have not the intelligence needed to appreciate how much is done for them by those who have charge of them, and are disposed to look at the restraints of discipline as so much unkindness. As Miss Edgeworth remarks, "gratitude is one of the most certain, but one of the latest, rewards which preceptors and parents should expect from their pupils." And it is evident that the teacher has fewer resources at his command than the parent for winning the warm affection of the child. Still, much may be done. The child has his hardships at school. Study is not always a delight, especially at the outset. Here is the teacher's opportunity. The closer he comes to the learner, in kindly appreciation of his special difficulties, the more he will call forth childish gratitude. The severity of the tutor and the disciplinarian may well be mitigated on occasion by active participation in childish pursuits.

In these ways, by proving himself the child's friend, the teacher may in time win a responsive sympathy and a habit of consideration from the learner. The securing of this sympathy of the child is of the first consequence to success in teaching. The wish to please is one of the most valuable spurs to intellectual industry. A child that has real affection for his teacher will, partly by unconscious absorption or imitation, partly by an active desire to understand and participate in the feelings of one whom he loves, gradually catch something of his spirit, and be affected by his enthusiasm. I have known boys taking eagerly to studies that were rather distasteful than attractive under the influence of a strong affection for their tutor.

Hardly inferior to this influence of sympathy between teacher and learner is that of a sympathy between the learners themselves. A child brought into a class which exhibits a lively interest in learning will, by the force of contagion, be infected by something of the prevailing tone of feeling. Bright, eager class-mates are a potent stimulus to the individual child. This is one important ingredient in the influence of numbers in education. Where the relations between the learners grows closer, and affection is called forth, a new and valuable force working in the direction of intellectual industry is supplied. Many a young intelligence has brightened under the genial influence of sympathetic contact with a more developed and stronger mind.

While sympathy is thus valuable as an aid to intellectual training, it is a still more vital element in moral training. Love for the parent or teacher provides the strongest safeguard against wrong-doing. To an affectionate child the wounding of the heart of one whom he loves is intense suffering. The influence of a high moral character acts through the desire for sympathy. The child imitates and tries to be like the person he loves and reveres because he wants to be in unison with him. In addition to this, as we shall see presently, sympathy with others generally forms an important element in a good moral disposition. To draw out the sympathies of the young, and so to bring under the selfish and anti-social feelings, is a chief part of moral education.

The work of educating the sympathies calls for special care. The home offers a wider scope than the school for the full manifestation of sympathy in active kindness and mutual help. The parent should guard against a habit of indulging human feeling with no proportionate readiness to work for the relief of suffering. Hence the feeling of pity should not be wholly or chiefly called forth at first by touching stories, but rather by actual instances of suffering which offer scope for benevolent exertion. It is only too easy to stimulate the externals of kind feeling without a genuine spirit of benevolence, and the educator should rather repress than encourage what may be called theatrical tears in young children.

The sympathetic feelings, and the sentiment of humanity which is their highest product, should be cultivated in connection with those studies which have to do with human life and its products, and more especially history and literature. The clear understanding and just appreciation of the ideas, aims, and motives both of individuals and of communities necessitates a certain exercise of the sympathetic imagination. Hence the study of human actions as unfolded in the page of history, and of the thoughts and sentiments of the greatest minds, as conserved in literature, supplies a means of developing the sympathies. Here the aim of the educator should be to widen the range of his pupil's sympathies, and to develop in him a deeper and more delicate insight into the common yet infinitely varied experiences and feelings of mankind.

APPENDIX.

On the egoistic and the social feelings of childhood, see Perez, "The First Three Years of Childhood," chap. iii ; on their educational bearings, consult Bain, "Education as a Science," chap. iii ; on the special cultivation of sympathy, see Miss Edgeworth, "Practical Education," chap. x ; Mdme. Necker, "L'Education," livre v, chap. iv ; and Dittes, "Grundriss," § 66 and following.

CHAPTER XVIII.

THE HIGHER SENTIMENTS.

In the present chapter we shall be concerned with the third and highest order of emotion, the abstract sentiments. The full development of these belongs to the period of adolescence and maturity; but the germs appear in early life, and it is an important part of education to develop and strengthen them.

The Intellectual Sentiment.—The first of these sentiments is one with which the educator is specially concerned in connection with intellectual culture, viz., the intellectual sentiment. This includes various feelings that grow up about and attach themselves to the pursuit and attainment of knowledge of different kinds. They are commonly spoken of as the pleasures of knowledge, and when developed into the permanent form of an affection they constitute the love of truth. In their relation to the will as a stimulus or incentive to action they are known as curiosity or the desire for knowledge.

Feeling of Ignorance and Wonder.—It is commonly said that the desire for knowledge begins with a sense of ignorance or a feeling of perplexity in face of the unknown. This in itself is a painful feeling. A child that becomes aware, e. g., by overhearing the talk of others, that there are things he knows nothing or little of is, for the moment, rendered uncomfortable and discontented.

In a somewhat different way this feeling of dissatisfaction arises in presence of things that are new, strange, and puzzling. Take, for example, the first sight of a rainbow. The child is first struck by the novelty and beauty of the phenomenon. This constitutes a mode of pleasurable excitement which we call wonder. The child's mind may stop here, contenting itself with the exhilarating effect of the marvelous. This is what happens with emotional children and adults in whom the love of the marvelous is strong. Hence the feeling of wonder in its more violent and intoxicating form is opposed to the desire to know and to scientific curiosity. When, however, the feeling of wonder does not thus master and intoxicate the mind, the very strangeness of the phenomenon stimulates the mind to inquiry. Thus the child asks what the rainbow is, and how it came there. That is to say, out of a feeling of surprise and wonder is developed an impulse of curiosity.

Pleasure of Gaining Knowledge.—While the love of knowledge thus takes its rise in a painful feeling—the sense of ignorance or of perplexity—it is greatly reinforced by the pleasurable feelings which accompany the attainment of knowledge. As was pointed out above, all intellectual exertion, provided it is not carried to the point of fatigue, is pleasurable. Each kind of intellectual activity is accompanied by its proper satisfaction. Thus the exercise of the observing powers brings with it the enjoyment of sense-activity, e. g., the pleasures of color and of movement. The exercise of each of the two great intellectual functions, discrimination and assimilation, is attended with a peculiar satisfaction. There is a gratification in contrasting objects, and in noting the finer shades of difference among things. On the other hand, the connecting of unlike things by some bond of affinity supplies another and still more vivid form of gratification. There is the exhilaration of surprise and novelty, and a peculiarly agreeable sense of intellectual movement and command in assimilating and so unifying things hitherto regarded as unlike and disconnected. Children often betray their susceptibility to this feeling in the look of wondering delight which accompanies the discovery of some real or fanciful resemblance among objects.*

The full enjoyment of intellectual activity is known in those more prolonged operations where the mind is busily searching for some new fact or truth. The passive reception of a new piece of knowledge, even when the pains of ignorance or of perplexity have preceded, gives but little delight compared with the active discovery of it for one's self. A boy who works out unaided a problem in geometry has an amount of satisfaction wholly incommensurable with that of the boy who has the solution at once supplied him. In this case the full activity of the mind is awakened, trains of ideas pass rapidly through the mind, and there is the glow of intellectual excitement. In addition to this there is the pleasure of pursuing an end, the delight of intellectual chase. A moderate amount of difficulty and delay only stimulates the intellectual powers to a higher tension, and so adds to the zest. At the end there is the joyous feeling of successful attainment, of difficulties overcome, and of triumph.

Finally, as pointed out above, the mastery and possession of knowledge is accompanied by a pleasurable consciousness of expansion and growth. The mind of the learner feels itself enriched by a new possession. And the new attainment is felt to be a source of personal strength. It has lessened for the inquirer the region of the unknown and obscure, and adds to his self-confidence in confronting the world. In many cases, too, the new possession gives the mind a firmer hold on previous acquisitions. Thus the discovery of a new general truth throws light on

* The delight which the mind thus experiences in discovering new identities is seen plainly in the charm of poetical simile.

facts which were once obscure, and serves to bind many detached fragments of knowledge by one uniting principle. And as a last result, the new acquisition gives the learner the pleasurable sense of increased practical efficiency. The ultimate function of all knowledge is to guide action, and the heightened sense of power which attends increase of knowledge includes a certain imaginative realization of its many practical applications.[40]

Children's Curiosity.—The delight in learning and extending the range of knowledge which we have just analyzed is the result of a long process of growth. To love truth for its own sake, and to be willing to take pains to pursue it in whatsoever direction it invites to pursuit, is a rare attainment even among adults. Nevertheless children betray most distinctly the germs of these feelings.

The very situation of children among their new surroundings renders them highly susceptible to the effects of wonder and curiosity.[41] The objects and processes of their environment are new to them and attract their attention. They have not yet formed habits of indifference to what is customary; nor has the narrowing business of life circumscribed their intellectual interest in things. Hence, the fact, familiar to every parent, that children put so many odd, out-of-the-way questions on matters that seem to have no connection with their personal interests.

Much of this wondering curiosity is no doubt fleeting and fugitive enough. The feeling of ignorance is not fully excited, and the desire to know is not sustained by a definite and sufficient interest in the particular subject. Hence the further experience of parents that the young questioner often tires of his subject before the answer is given, and wanders off to fresh fields of inquiry.

A real feeling of inquisitiveness, sufficient to sustain a prolonged act of attention, must be supported by some special fund of interest. As already pointed out, intellectual interest naturally takes its rise out of other kinds (personal, practical, æsthetic). The personal experiences and predominant feelings and tastes of the child determine the directions of curiosity and of the wish to learn about things. The child has little or no love of knowledge in the abstract; but he has the germ of a number of loves corresponding with different departments or directions of knowledge. Thus, as Madame Necker observes, his delight in pretty objects, especially flowers, shells, and birds, forms a natural basis for curiosity as to the facts of natural history. Again, the love of the marvelous, the impulses of adventure, and the germs of social feeling and sympathy constitute a natural support for an intellectual interest in human action, and in history.*

Growth of Intellectual Feeling.—In this way the child's curiosity and appreciation of knowledge tend from the first to crystallize in definite forms, which we call his special intellectual interests. The direction of these is fixed partly by natural tastes, and partly by the special circumstances of his life. What is seen every day, and is connected closely with the home experience, naturally supplies the nucleus for a permanent intellectual interest. Thus the son of a farmer naturally grows inquisitive about horses, crops, and so forth. Much, too, is due to the influence of example and of unconscious sympathy. The departments of knowledge on which the father or the teacher sets value tend to become those of most interest to the child.

The growth of intellectual feeling may be measured in two directions: (*a*) the deepening of interest in certain definite directions, e. g., natural science, language; and (*b*) the widening of interests, and the development of a general impartial curiosity in things. These two direc-

* On the nature of childish curiosity see M. Perez, "First Three Years of Childhood," chap. vi, sect. 1; Bain, "Education as a Science," p. 90, etc.

tions of development are in a measure distinct and even opposed. Absorption in special lines of inquiry is fatal to a general spirit of inquisitiveness.

In seeking to develop the intellectual feelings and interests the educator must follow the order of nature. It is vain to look for a keen and dominant thirst for knowledge at first; for such a feeling, except in the case of a few highly gifted children, is a slow product. The young are unable to realize all the pleasure of intellectual activity, and they can not at first appreciate its great practical utility. Hence, adventitious aids must be resorted to; and here the principle of association should be made use of, and a certain liking for intellectual pursuits produced by making all its accompaniments as agreeable as possible. A pleasant voice and manner in a teacher may do much to recommend an indifferent subject to the notice of his pupils.

At the same time, it is possible to depend too much on extraneous and associated interest. Our modern system of school competition, with its machinery of examinations, published lists, and so forth, is apt to suggest to the learner that the value of learning is altogether relative and dependent.

The educator should from the first aim at exciting a love of knowledge for its own sake and a desire to attain truth. This end may be secured to some extent by the influence of example and sympathy. A teacher that manifests a genuine and a keen interest in the subjects he teaches will as a rule have interested pupils. In addition to this the educator must make the most of children's spontaneous impulses of curiosity, watching their directions, and so learning how best to fix interest and inquiry in definite channels. As supplementary to this, the educator should try to retain something of that wide detached curiosity of the first years of life, and foster a disposition to examine and inquire about things generally.

The Æsthetic Sentiment.—The second of the three sentiments to be now considered is known as the æsthetic emotion, and also as the pleasures of beauty or taste. These include a variety of pleasurable feelings, namely, those answering to what is pretty, graceful, harmonious, or sublime in natural objects or in works of art. To these pleasures there correspond the disagreeable feelings excited by what is ugly, discordant, and so forth.

These pleasures are the accompaniments of impressions made on the mind by external objects through one of the two higher senses, sight and hearing, and more particularly sight. The pleasure arises immediately from the perception or recognition of some agreeable feature or quality in the object, as the brilliance of a color, the purity of a tone, the symmetry of a temple.

The æsthetic enjoyments rank high among our pleasures. They contrast with the lower pleasures of sense and appetite in their refinement or purity. They constitute a surplus, so to speak, over the daily satisfaction which we experience in connection with the necessary work of life. The delight in what is beautiful owes nothing to any feeling of the usefulness of the object. The cultivation and gratification of the æsthetic feelings is thus closely analogous to play, activity engaged in for its own sake. And lastly, the pleasures we experience in observing the beautiful aspects of nature or works of art are eminently a socializing gratification. Numbers may together enjoy a beautiful picture or a piece of music, and the pleasure be greatly increased by interchanges of sympathy.*

Elements of Æsthetic Pleasure.—The pleasure which arises from the contemplation of a beautiful object, whether in nature or in art, is of various kinds and of different degrees of dignity, according to the rank of the

* The child testifies to this social character of the feeling in its instinctive impulse to call its mother's attention to what is pretty. See Perez, "The First Three Years of Childhood," p. 271.

mental faculty specially concerned. (1) The simplest mode of such pleasure is the sensuous enjoyment which arises out of a perfect stimulation of the sense-organ concerned. The pleasure of brilliant light and of color, of graceful curve, and of pure musical tone, illustrates this sensuous element. (2) A higher grade of æsthetic gratification is connected with a conscious mental activity in discovering pleasing relations among these sensuous materials, and more particularly the combination of a variety of pleasing details in a worthy whole. This involves the exercise of perceptive faculty. This element of æsthetic pleasure is realized in the appreciation of relations of contrast and harmony among colors, of beauties of space-form, or form as it presents itself to the eye, including symmetry and proportion; of beauties of time-form, or the pleasing grouping of sounds in succession, including rhythm, meter, together with those arrangements of musical tone which we call tune or melody. (3) Besides these presentative elements in the enjoyment of beauty we have representative elements. These include the pleasures of suggestion and of imagination. Much of the charm of natural things, as the flower by the wayside, the bubbling sound of a stream, the fragment of ruined castle, depends on association with what is pleasing, touching, or sublime.

Finally, the enjoyment of a work of art depends to a considerable extent on the appreciation of its fidelity to truth and life. The imitative arts, more particularly painting, dramatic spectacle, and poetry, aim at presenting some aspect of nature or human life by the medium of artistic semblance, and the resulting enjoyment arises in part from a recognition of its verisimilitude. Here æsthetic pleasure connects itself with the properly intellectual gratification of apprehending truth.

Æsthetic Judgment: Taste.—We commonly speak indifferently of a feeling for what is beautiful, or of a perception or recognition of beauty. And this shows that the element of feeling is here closely connected with an intellectual process. The first appreciation is largely emotional. That is, we say a thing is beautiful because the contemplation of it affects us agreeably. This may be called an automatic or unconscious æsthetic judgment. A conscious or intelligent judgment includes more than this, namely, a process of comparison of object with object, and a recognition of certain aspects of these, such as purity of color or elegance of form, as the specific source of the enjoyment.

Standard of Taste.—The sphere of taste is proverbially uncertain. Individuals and communities differ widely in their æsthetic preferences. Yet amid these variations certain uniformities and laws of taste are discoverable. Such principles supply a standard of taste by help of which the individual may regulate his decisions and judge correctly. The standard is built up first of all by observing what the best judges of all times have approved, and supplementing this by reflection on the true nature of beauty and art.

We may say that taste is wrong when it approves anything that the normal nature of man condemns, such as a distinctly discordant arrangement of sounds or colors. From mere rightness or soundness of taste we have to distinguish refinement or discriminative delicacy. This answers to the degree of culture of the faculty attained. A child's simple æsthetic preferences may be right, or in good taste, though from an adult's point of view they are lacking in refinement or discrimination.

Growth of Æsthetic Faculty.—The feeling for beauty in its higher and more refined form is a late attainment, and presupposes an advanced stage of intellectual and emotional culture. At the beginning of life there is no clear separation of what is beautiful from what is simply pleasing to the individual. As in the history of the race, so in that of the individual, the sense of beauty slowly extricates itself from pleasurable consciousness in general, and differentiates itself from the sense of what is personally useful and agreeable.*

The order of development of the æsthetic feeling answers in its main outline to the threefold grade of enjoyment indicated above. The infant's first crude experience of the delight of beauty is supplied by some new and ravishing sense-impression, as the dance of the sunlight on the wall, the brilliant coloring of a tulip, the sweet sound of a bird's song, and so on. The intellectual appreciation of form (symmetry and proportion) presupposes the development of the powers of observing and comparing, and so comes later. Children feel at first the charm of this and that detail in isolation, but have no power of grasping the relations of a number of parts in a beautiful whole.† And lastly, the enjoyment of the suggestions and ideal significance of things is only possible when experiences have multiplied, and the representative powers have grown in strength. The child does not feel the pathos of the ruined castle or the sublimity of the mountain peak, because experience and thought have not yet invested the objects with numerous and rich associations.

While we may thus roughly mark off the sensuous as the first stage, and so on, we must remember that each side of the æsthetic faculty advances concurrently. There is a gradual transition from crude and coarse to refined pleasure, from simple to complex enjoyment, under each head. Thus the young child takes pleasure at first only in the more striking and vivid sensuous effects of light and sound. Then, as his discriminative sensibility devel-

* See M. Perez, "The First Three Years of Childhood," p. 270, and following.

† Hence, as Madame Necker observes ("L'Education Progressive," ii, 158), a child has no sense of the total picturesque charm of a landscape. The sense of time-form, or rhythm, is, however, very early developed. See Perez, *ibid.*, p. 42.

ops, he begins to detect more unobtrusive charms, as the quiet beauty of subdued coloring, and the worth of pure color, and so forth. Similarly, his appreciation of juxtapositions of colors and sounds, and of relations of form, both in space and time, grows in refinement. Finally, as his experience widens and his knowledge increases, the meanings and suggestions of things grow in richness. A flower acquires a deeper charm as the mind comes to understand its delicate structure and its short, fragile life, and as it becomes invested with a myriad happy associations of early life, and with a moral and religious significance.

While the æsthetic faculty thus develops on the passive or appreciative side, it asserts itself as an active or creative impulse as well. This impulse, which has a triple root in the love of activity, of imitating nature, and of expressing or embodying forth some internal idea, is among the oldest instincts of the race, and betrays itself very early in the life of the individual. Children show even in their first year a germ of artistic creativeness. They enter into the spirit of playful acting; * they exhibit an impulse to fashion or arrange things with their tiny hands. Children's play is, as already observed, a naïve, unconscious sort of art-production. As their taste and their powers of execution progress, they derive a greater enjoyment from the production of such artistic effects. And on the other hand, the exercise of these creative impulses tends very materially to strengthen and widen the interest in contemplating art-products generally.

Again, as the child's æsthetic experience, or his familiarity with what is beautiful in nature and art, deepens and widens, his faculty of judgment will grow more firm

* Mr. Darwin observes that his boy, when about thirteen months old, showed "a touch of the dramatic art" by pretending to be angry and slapping his father for the sake of the agreeable *dénoûment*, a kiss. See "Mind," vol. ii (1877), p. 291.

and competent. From the first the child is building up more or less consciously, a standard of æsthetic reference. This will be in part the outcome of his individual tastes and preferences, for every child tends to impose these as a law on others; but in the main it will reflect the external authority under which he lives, that is, the artistic models in the shape of pictures, dress, etc., by which he has been habitually surrounded, and the current maxims of his parents, teachers, etc. But as his tastes develop, his range of artistic experience and knowledge widens, and his powers of individual reflection gain in strength, he will gradually improve on this first temporary standard, and, by gaining a deeper insight into the real and universally recognized grounds of æsthetic and artistic worth, grow in clearness and precision of judgment.

The Education of Taste.—As already pointed out, the education of the feelings culminates in the development of taste. Æsthetic culture owes its educational importance to the fact that by refining the feelings, detaching them from personal concerns, and connecting them with objects of common perception, it greatly widens and elevates the child's sources of happiness.*

The development of taste implies certain external conditions. Among these, education plays an important part. The social surroundings exert, in early life at least, a potent influence. As already pointed out, the child takes its cue as to what is pretty from what it sees about it and hears others approve. Hence, by controlling the artistic environment and by direct teaching, much may be done by the educator to mold the growing taste of the young.

To begin with, since the æsthetic faculty, like the other faculties, grows by exercise on suitable material, it is important to surround the child from the first with what is

* On the effect of æsthetic training in moderating and purifying the feelings, and so preparing the way for *moral* education, see Dittes, "Erziehungs- und Unterrichtslehre," § 56.

pretty, attractive, and tasteful. In developing the taste, as the other faculties, we must remember that it is first impressions which produce the most lasting effect. In early life the foundations of a love of natural scenery should be laid by steeping the young mind as far as possible in the impressions of nature, the colors of earth, water, and sky, and the manifold pleasing sounds of stream, wood, and living creatures. It is only by such early companionship with Nature that the most valuable æsthetic associations can be built up.*

In the second place, much may be done by the mother or other educator by way of directing the child's attention to what is beautiful in his natural surroundings, pointing out those aspects of objects which are fitted to please the eye and mind, and so calling the æsthetic faculty into exercise.[42] The training of the sensuous side of the faculty is in itself a considerable work. We all tend to overlook the exact character of sense-impressions, the finer details of light and shade, color, and line in objects, owing to the superior interest of their suggestions, namely, the objects themselves, and their uses, etc. A child looking at a tree-trunk overgrown with moss, or an old wall tinted with lichens and flowers, is apt to pass by these unobtrusive details, and to wonder how high the tree or wall is, and whether he could climb it. In order to see exactly what is present to the eye, a special interest in sense-impressions, and a habit of close attention is necessary, and hence the educator of the æsthetic faculty should seek to develop that finer and rarer sort of observing power which finds nothing too common or insignificant. The educator may do much, too, in directing the child's attention to the beautiful forms of objects, to the noble symmetry of the

* On the evils accruing to children in our large towns from the love of country surroundings, and the possibility of alleviating these, see an eloquent paper by Archdeacon Farrar on "Art in Schools," published in the "Journal of Education," December, 1884.

mountain, the varying curve of the river's course, the severe regularities of the crystal, and the graceful proportions of living forms. Nor should he fail, by exercising the child's imaginative and reflective faculties, as well as by direct instruction, to bring out those rich and poetical suggestions in things which make up so much of their æsthetic value.

While the child's faculty of taste is thus being developed in the contemplation of nature's beauty, it should be further educated by habitual contact with good art. And here the arrangements of the home, the dress, and so forth, should be such as to awaken the first sense of what is graceful and harmonious. The influence of a refined mother, who studies what is pleasing and harmonious in the home and her own appearance and manner, may be all-important in exciting a nascent feeling for beauty, and giving the first direction to the child's standard of taste. More than this, the child should from the first be educated in the appreciation of the fine arts. The picture-books of the nursery should be artistic, so that from the first the child's mind may be familiarized with and accustomed to what is life-like and graceful in art. The cultivation of a taste for music and for poetry presupposes a special training by help of the best productions of these arts.

This artistic training, to be complete, should call forth the productive impulses of the child. And this in part because all artistic skill is a source of pure and elevating enjoyment both to the producer himself and to others; and in part because a certain degree of familiarity with the elementary processes of artistic production is necessary to a deep appreciation of what is beautiful.[43]

In training the æsthetic faculty great care is needed lest we hurry the process of natural and normal growth. Children who have a too refined standard of beauty set before them are apt to affect a taste for what they do not really care about. We should be careful not to force our higher standard of what is beautiful on children. They should not only be allowed but even encouraged to relish the simple æsthetic enjoyments proper to their age, as the charm of brilliant colors, and forcible contrasts of color, of simple symmetrical patterns, and so on. Great care must be taken not to overrefine their taste, to deaden the healthy instinctive feelings, and so unduly narrow the region of enjoyment.[44]

With respect to the exercise of the æsthetic judgment, children should be encouraged to be natural, and to pronounce opinion for themselves. The teacher should never forget the great individual differences of sensibility and taste, and should allow a legitimate scope to independent reflection and judgment. Taste is the region which most safely admits of freedom of opinion, and constitutes, therefore, in early life the best field for the exercise of individual judgment. On the other hand, the child should not be allowed to become overconfident and opinionated, and intolerant of others' sentiments, but by instruction in the diversities of taste led to entertain his individual preferences with a becoming modesty.

The cultivation of the æsthetic sentiment may enter into almost every department of education. On one side it stands in close connection with intellectual training. The feeling for what is graceful or elegant may be developed to some extent in connection with such seemingly prosaic exercises as learning to read and to write ; and by this means a certain artistic interest may be infused into the occupation. The teaching of the use of the mother-tongue in vocal recitation and written composition offers a wider field for the exercise of the æsthetic sense in a growing feeling for rhetorical effect and for literary style. Many branches of study tend to develop the æsthetic feelings, and owe much of their interest to this circumstance. This is pre-eminently true of classical studies and of literature generally, which, as already pointed out, specially exercise the imagination on its æsthetic side. Physical geography may be so taught as to elicit a feeling for the picturesque and the sublime in natural scenery, and history, so as to call forth a feeling of sympathetic appreciation for the picturesque lights and shadows of human life and experience, and admiration for what is great and noble in human conduct and character. Even the more abstract studies, as geometry and physical science, may be made a means of evoking and strengthening a feeling for what is beautiful, not only in material objects (e. g., regularity and symmetry in geometric figures, beauties of form and color in minerals, plants, and animals), but in ideas, and their logical relations.

On another side, the training of the æsthetic sense comes into contact with moral training. To adopt and practice, in mode of dress, in speech, and generally in manners, what is agreeable to the æsthetic feelings of others, is a matter of so much social importance that it is rightly looked on as one of the lesser moral obligations. Hence the stress laid in the early period of training on the cultivation of naturalness and fitness in carriage, movement, and speech, on neatness in dress, etc., and on the graces of courtesy.[45]

It is to be observed finally, that in training the æsthetic faculty a natural order is to be followed answering to the development of faculty. Thus it is evident that tune singing, or singing in unison, must precede part singing, which presupposes the development of a sense of musical harmony. Similarly, a certain training in the use of colors may appropriately precede exercises in drawing.

Ethical or Moral Sentiment.—We now come to the last of the three sentiments, that known as the ethical or moral sentiment. This feeling is commonly spoken of under a variety of names, such as the feeling of moral obligation or the sentiment of duty, the feeling of reverence for the moral law, the sentiment of moral approbation and disapprobation, the love of virtue.

The moral sentiment has for its proper object human actions, and the motives and character which underlie these. It is called forth by a perception of, and reflection upon, actions which we commonly distinguish as good and bad, and more narrowly as right and wrong. These actions may be our own or those of another. We approve what is right in ourselves and in others. Right action may be provisionally defined as that which conforms to the moral law.

The essential ingredient in the moral sentiment is a feeling of obligation or of "oughtness." In approving an action as right we feel that it binds us, that we are not free to do or not to do it, as in the case of indifferent actions. We acknowledge our allegiance to an authority outside of us.

The moral sentiment is in a pre-eminent sense a social feeling. The sentiment of duty is bound up with the individual's social relations. The child's first consciousness of obligation is the recognition of others' authority over him ; and the highest form of moral sentiment is based on the sympathetic realization of others' interests and claims, and the recognition of the supremacy of the common good over the interests of the individual.

This feeling assumes one of two unlike forms, as the action approved or disapproved is our own or another's. In the former case we have the pleasing consciousness of fulfilling the obligation that binds us, or the painful sense of violating it. In its fully developed phase of conscience, feeling of remorse, etc., this sentiment involves a clear reflection on self, its capabilities and responsibilities. In the latter case the feeling has no direct reference to self. In condemning another's act as wrong, we are not realizing our own subjection to the moral law, but rather asserting its authority over another.

While the feeling of moral disapproval and approval is one and the same throughout in its essential ingredient, it assumes a variety of phases according to the particular nature of the action which is its object, and the special associations and feelings it calls up. Thus in the feeling with which we condemn a lie there is a distinctly intellectual ingredient, a painful shock of contradiction; in the sentiment with which we denounce a piece of wanton cruelty there is an ingredient of anger; and so on.

Lastly, there is the important difference between the bare approval of what is a *duty*, and the warmer feeling of commendation or praise which we experience when contemplating a *virtuous* act, that is, one which clearly exceeds the limits of duty. This feeling has an æsthetic element in it, viz., admiration of what is rare and lofty. In the case of our own actions this difference shows itself as the contrast between a bare self-satisfaction and a feeling of personal merit and desert.

These different forms of the moral sentiment may coexist in very unequal strength in the same individual. A boy may have a fairly keen abhorrence of cruelty, and yet be wanting in a feeling for truth or veracity. These individual differences point to the diversity in the nature of these feelings, and also to the fact that the directions of the moral feeling and the objects or ideas it attaches itself to are largely fixed by external influences and by education.

Moral Feeling and Moral Judgment.—Here, as in the case of the æsthetic faculty, the emotional element is bound up with a properly intellectual process. Conscience includes not only a susceptibility to feeling of a certain kind, but a power or faculty of recognizing the presence of certain qualities in actions (rightness, justness, etc.), or of judging an act to have a certain moral character. Some amount of intellectual discrimination must, of course, accompany and precede every moral feeling.

We can not feel moral repugnance at an act of meanness or cruelty except when we discern to some extent the character of the action. In some cases, however, the judgment is very vague. Thus we may have a strong feeling of the injustice of an action, and yet be quite unable to say wherein exactly the injustice lies. In contrast to this blind form of moral judgment there is the intelligent one, in which feeling is controlled by reflection. The full exercise of the moral faculty includes the cooperation of feeling or sentiment and the intellectual faculty of judgment.

The Moral Standard.—Men's judgments as to what is right and wrong are not perfectly uniform. We find different standards set up in different communities, and in the same community at different times. Lying, suicide, etc., are differently estimated by different nations, and the same differences show themselves in smaller communities. In one school current ideas and feelings about what is mean, dishonorable, and so on, may vary considerably from those reigning in another school. Wherever a community forms itself, we see a tendency to the adoption of a special local standard of what is right and praiseworthy.

These narrow standards have to be corrected by comparison of one system with another. By finding out what is common to them, and by reflecting on the highest and best interests of man, the moralist aims at constructing an ideally perfect statement of the moral law which is to serve as a universal and final standard of right and wrong.

Growth of the Moral Sentiment.—It has been long disputed whether the moral faculty is innate and instinctive, or whether it is the result of experience and education. The probability is that it is partly the one, and partly the other. The child shows from an early period a disposition to submit to others' authority, and this moral instinct may not improbably be the transmitted result of the social experience and moral training of many generations of ancestors. Yet, whatever the strength of the innate disposition, it is indisputable that external influences and education have much to do in determining the intensity and the special form of the moral sentiment. We have now to trace the successive phases of its development.

A consciousness of moral obligation arises in the first instance by help of the common childish experience of living under parental authority at the outset. The child's repugnance to doing what is wrong is mainly the egoistic feeling of dislike to or fear of punishment. By the effect of the principle of association or "transference," dislike to the consequences of certain actions might lead on to a certain measure of dislike to the actions themselves. And such an effort would greatly strengthen the innate disposition to submit to authority.

When the forces of affection and sympathy come into play, this crude germ of moral feeling would advance a stage. An affectionate child, finding that disobedience and wrong-doing offend and distress his mother or father, would shrink from these actions on this ground. Not only so, the promptings of sympathy would lead the child to set a value on what those whom he loves and esteems hold in reverence. In this way love and reverence for the father lead on naturally to love and reverence for the moral law which he represents, enforces, and in a measure embodies.

Even now, however, the love of right has not become a feeling for the inherent quality of moral rightness: it is still a blind respect for what is enjoined by certain persons who are respected and beloved. In order that the blind sympathetic regard may pass into an intelligent appreciation, another kind of experience is necessary.

Thrown with others from the first, a child soon finds that he is affected in various ways by their actions.

Thus another child takes a toy from him or strikes him, and he suffers, and experiences a feeling of anger, and an impulse to retaliate. Or, on the contrary, another child is generous and shares his toys, etc., with him, and so his happiness is augmented, and he is disposed to be grateful. In such ways the child gradually gains experience of the effect of others' good and bad actions on his own welfare. By so doing his apprehension of the meaning of moral distinctions is rendered clearer. "Right" and "wrong" acquire a certain significance in relation to his individual well-being. He is now no longer merely in the position of an unintelligent subject to a command: he becomes to some extent an intelligent approver of that command, helping to enforce it, by pronouncing the doer of the selfish act "naughty," and of the kind action "good."[46]

Further experience and reflection on this would teach the child the reciprocity and interdependence of right conduct; that the honesty, fairness, and kindness of others toward himself are conditional on his acting similarly toward them. In this way he would be led to attach a new importance to his own performance of certain right actions. He feels impelled to do what is right, e. g., speak the truth, not simply because he wants to avoid his parents' condemnation, but because he begins to recognize that network of reciprocal dependence which binds each individual member of a community to his fellows.

Even now, however, our young moral learner has not attained to a genuine and pure repugnance to wrong as such. In order that he may feel this, the higher sympathetic feelings must be further developed.

To illustrate the influence of such a higher sympathy, let us suppose that A suffers from B's angry outbursts or his greedy propensities. He finds that C and D also suffer in much the same way. If his sympathetic impulses are sufficiently keen he will be able, by help of his own similar sufferings, to put himself in the place of the injured one, and to resent his injury just as though it were done to himself. At the beginning he will feel only for those near him, and the objects of special affection, as his mother or his sister. Hence the moral importance of family relations and their warm personal affections, as serving first to develop habitual sympathy with others and consideration for their interests and claims. As his sympathies expand, however, this indignation against wrong-doing will take a wider sweep, and embrace a larger and larger circle of his fellows. In this way he comes to exercise a higher moral function as a disinterested spectator of others' conduct, and an impartial representative and supporter of the moral law.

Development of Self-judging Conscience.—The highest outcome of this habit of sympathetic indignation against wrong is a disinterested repugnance to wrong when done by the individual himself. A child injures another in some way, either in momentary anger or through thoughtlessness. As soon as he is able to reflect, his habit of sympathy asserts itself, and causes him to suffer with the injured one. He puts himself at the point of view of the child he has wronged, and from that point of view looks back on himself, the doer of the wrong, with a new feeling of self-condemnation. On the other hand, when he fulfills his duty to another or renders him a kindness, he gains a genuine satisfaction by imaginatively realizing the feelings of the recipient of the service, and so looking back on his action with complacency and approval.

When this stage of moral progress is reached, the child will identify himself with the moral law in a new and closer way. He will no longer do right merely because an external authority commands, or because he sees it to some extent to be his interest to do so. The development of the unselfish feelings has now connected an internal pain, the pang of self-condemnation and of remorse, with the consciousness of acting wrongly ; and this pain, being immediate and certain, acts as a constant and never-failing sanction.

The higher developments of the moral sentiment involve not only a deepening and quickening of the feelings, but a considerable enlightenment of the intelligence. In order to detect the subtler distinctions between right and wrong, delicate intellectual processes have to be carried out. Rapidity and certainty of moral insight are the late result of wide experience, and a long and systematic exercise of the moral faculty on its emotional and intellectual side alike.

The Training of the Moral Faculty.—Since the moral feeling stands in a peculiarly close relation to the will, the practical problem of exercising and developing it is intimately connected with the education of the will and the formation of the moral character. This larger problem we have not yet reached, but we may even at this stage inquire into the best means of developing the moral sentiment regarded apart from its influence as a motive to action, and merely as an emotional and intellectual product.

Inasmuch as the government of the parent and the teacher is the external agency that first acts upon the germ of the moral sentiment, it is evident that the work of training the moral feelings and judgment forms a conspicuous feature in the plan of early education. The nature of the home discipline more particularly is a prime factor in determining the first movements of growth of the childish sense of duty. In order that any system of discipline may have a beneficial moral influence and tend in the direction of moral growth, it must satisfy the requirements of a good and efficient system. What these are is a point which will be considered later on. Here it must suffice to say that rules must be laid down absolutely, and enforced uniformly and consistently, yet with a careful consideration of circumstances and individual differences. Only in this way will the child come to view the commands and prohibitions of his parent or his teacher as representing and expressing a permanent and unalterable moral law, which is perfctly impartial in its approvals and disapprovals.

The effect of any system of discipline in educating and strengthening the moral feelings and judgment will depend on the spirit and temper in which it is enforced. On the one hand, a measure of calm becomes the judicial function, and a parent or teacher carried away by violent feeling is unfit for moral control. Hence everything like petty personal feeling, as vindictiveness, triumph, and so forth, should be rigorously excluded.

On the other hand, the moral educator must not, in administering discipline, appear as a cold impersonal abstraction. He must represent the august and rigorously impartial moral law, but in representing it he must prove himself a living personality capable of being deeply pained at the sight of wrong-doing. By so doing he may foster the love of right by enlisting on his side the child's warmer feelings of love and respect for a concrete personality. The child should first be led to feel how base it is to lie, and how cowardly to injure a weak and helpless creature, by witnessing the distress it causes his beloved parent or teacher. In like manner he should be led on to feel the nobility of generosity and self-sacrifice by witnessing the delight which it brings his moral teacher.

It is hardly necessary to add, perhaps, that this infusion of morality with a warm sympathetic reflection of the educator's feelings presupposes the action of that moral atmosphere which surrounds a good personality. The child only fully realizes the repugnance of a lie to his parent or teacher when he comes to regard him as himself a perfect embodiment of truth. The moral educator must appear as the consistent respecter of the moral law in all his actions.*

The training of the moral faculty in a self-reliant mode of feeling and judging includes the habitual exercise of the sympathetic feelings, together with the powers of judgment. And here much may be done by the educator in directing the child's attention to the effects of his conduct. The injurious consequences of wrong-doing and the beneficent results of right-doing ought to be made clear to the child, and his feelings enlisted against the one and on the side of the other. Not only so, his mind should be exercised in comparing actions so as to discover the common grounds and principles of right and wrong, and also in distinguishing between like actions under different circumstances, so that he may become rational and discriminative in pronouncing moral judgment.

What is called moral instruction should in the first stages of education consist largely of presenting to the child's mind examples of duty and virtue, with a view to call forth his moral feelings as well as to exercise his moral judgment. His own little sphere of observation should be supplemented by the page of history and of fiction. In this way a wider variety of moral action is exhibited, and the level of every-day experience is transcended. Such a widening of the moral horizon is necessary both for enlarging and refining the feeling of duty, and for rendering the meaning of moral terms deeper and more exact. And it stimulates the mind to frame an *ideal* conception of what is good and praiseworthy.

The problem of determining the exact relation of intellectual to moral culture is one which has perplexed men's minds from the days of Socrates. On the one hand, as has been remarked, the enlightenment of the intelligence is essential to the growth of a clear and finely dis-

* On the importance of a habit of exact veracity in the educator, see Miss Edgeworth, "Practical Education," i, chap. viii.

criminative moral sense. On the other hand, it is possible to exercise the intellect in dealing with the formal distinctions of morality without calling the moral faculty into full vital activity.

This practical difficulty presses with peculiar force when we come on to the later exercises of moral instruction. The full carrying out of the process of informing the moral intelligence naturally conducts to the more or less systematic exposition of the ideas and truths of ethics. An enlightened conscience is one to which the deepest grounds of duty have begun to disclose themselves, and which has approximated to a complete and harmonious ideal of goodness by a systematic survey and co-ordination of the several divisions of human duty and the corresponding directions of moral virtue and excellence. Something in the shape of ethical exposition is thus called for when the child reaches a certain point in moral progress. But the educator must be careful to make this dogmatic instruction supplementary to, and not a substitute for, the drawing forth of the whole moral faculty on its sensitive and on its reflective side alike by the presentation of living concrete illustrations of moral truth. Divorced from this, it can only degenerate into a dead formal exercise of the logical faculty and the memory.*

The education of the moral sentiment is, as we have seen, carried out in part by the influence of the child's companions. To surround him with companions is not only necessary for his comfort, but is a condition of developing and strengthening the moral feelings, as the sentiment of justice, the feeling of honor, and so on. The larger community of the school has an important moral function in familiarizing the child's mind with the idea

* The relation of intellectual to moral culture is dealt with in an interesting and suggestive paper by Mrs. Bryant, "The Intellectual Factor in Moral Education," published in the "Journal of Education," February, 1885.

that the moral law is not the imposition of an individual will, but of the community. The standard of good conduct set up and enforced by this community is all authoritative in fixing the early directions of the moral judgment.

This being so, it is evident that the moral educator must take pains to control and guide the public opinion of the school. And in connection with this he should seek to counteract the excessive influence of numbers, and to stimulate the individual to independent moral reflection.

APPENDIX.

On the cultivation of curiosity and a love of intellectual activity, see Locke, "On Education," sec. 118; Spencer, "Education," chap. iii; Bain, "Education as a Science," chap. vi, p. 177, etc.; Perez, "L'Education," chap. ii. The pleasure of independent discovery by the young is well illustrated by Prof. Tyndall, "Lectures on Education" (delivered at the Royal Institution), Lect. V. Cf. E. Thring, "Theory and Practice of Teaching," part i, chap. vi.

On the cultivation of taste, read Miss Edgeworth, "Practical Education," chap. xxii; Bain, "Education as a Science," chap. xiii; Mdme. Necker, "L'Education," livre v, chap. iii; Th. Waitz, "Allgem. Pædagogik," 2. Theil, 2. Absch., § 19; Perez, "L'Education," chap. iii, sec. ii; and Dr. Bruno Meyer, "Aus der æsthetischen Pædagogik."

The early stages of moral development are dealt with by Pfisterer, "Pædagog. Psychologie," kap. 2, §§ 16, 18. On the training of the moral faculty, etc., see H. Spencer, "Education," chap. iii; Bain, "Education as a Science," chap iii, p. 100, etc., *cf.* chap. xii; Mdme. Necker, "L'Education," livre iii, chap. vi; Beneke, "Erziehungs und Unterrichtslehre," i, 2. Kap., Abschnitt, 2 and 4; Th. Waitz, "Allgem. Pædagogik," 2. Theil, 2. Absch., § 14; Perez, "L'Education," chap. vii, sects. ii to v; and Compayré, "Cours de Pédagogie," part i, leçon x.

CHAPTER XIX.

THE WILL: VOLUNTARY MOVEMENT.

HAVING now traced in its main outlines the course of emotional development, we may pass on to the consideration of the development of the third side or phase of mind, namely, the active side, or willing.

Definition of Willing.—The terms will and willing are used in mental science in a comprehensive manner, so as to include all our conscious actions or doings, whether external bodily actions, as walking, speaking, or internal mental actions, as concentrating the thoughts, deliberating, etc. In a narrower and stricter sense willing covers only those actions that are accompanied by a clear conscious purpose. Thus the action of warding off a blow with the hand is an act of will, or a voluntary action, whereas blinking when an object is suddenly brought near the eye is spoken of as non-voluntary, because, though we are conscious of the movement, we do not distinctly purpose to perform it.

Willing, Knowing, and Feeling.—As was pointed out in an earlier chapter, there is a certain opposition between willing and the other two main modes of mental manifestation. Thus, to be actively engaged in doing something, contrasts with the quiet and comparatively passive mental attitude of reflection. The man of energetic action is popularly opposed to the man of reflection. Similarly, strong emotional excitement and action are incompatible, and the man of strong will is one who, among other things, brings emotion under control.

At the same time, voluntary action always includes an element of knowing and of feeling. The motive to voluntary action, the end or object desired, is the realization or gratification of some feeling (e. g., ambition, or the sense of duty). And we can not act for a purpose without knowing something about the relation between the action we are performing and the result we are aiming at. Thus, in every case it is feeling which supplies the stimulus or force to volition, and intellect which guides or illumines it.

Desire, the Basis of Willing.—When a boy acts with a purpose, say to win his teacher's favor, he desires something, viz., the realization of the idea or representation of something pleasurable. Desire is the fundamental fact in the process. It can only be defined as the outgoing of the mind in an active impulse or movement toward the realization of the idea or representation of something pleasurable.

Besides this positive movement of attraction toward what is seen to be pleasurable, there is a negative movement of repulsion away from what is painful, as, for example, the miserable humiliating experience of punishment. This negative form of desire is marked off as aversion.

Desire, though an active mental phenomenon, presupposes as its conditions an emotional and an intellectual element. We do not desire what is indifferent to us, but only what brings satisfaction. Our several experiences of pleasure and pain thus constitute so many sources of desire and aversion. In order, however, to desire a new realization of some pleasurable experience, it is necessary that the mind recalls and imagines it with a certain degree of distinctness. And here the intellectual element of representation comes into view. The strength of a desire thus varies with two elements: (1) the magnitude of the experience; (2) the degree of distinctness with which it is imagined. A schoolboy will generally desire the long vacation more eagerly than the weekly holiday. But we all fail to desire even great pleasures because we do not vividly represent them. This applies to all remote, as compared with near, prospects. Children do not strongly desire a distant pleasure, as winning a prize, because they are "weak in futurity," and can not picture distinctly and steadily the far-off delight. That which is near influences all of us, and especially the young, by way both of attraction and of repulsion, more powerfully than that which is remote.

Desire and Activity.—Desire is primarily a state of feeling, a sense of want and craving. At the same time it is closely connected with the state of active exertion. When a child desires a thing, he feels impelled to do something, to exert his active powers for the attainment of the object.

This active outcome of the state of desire varies according to special circumstances. Sometimes it is much fainter and less sustained than at other times. A child will often feel a strong craving for something, say a toy or a book, and yet not be disposed to any considerable exertion for the sake of this. We are not always equally disposed to do things. A child in a peevish, indolent mood is apt to prolong the state of desire till it grows excessively painful and wearing. Want of mental and bodily vigor is unfavorable to exertion. On the other hand, where there is robust vigor and a strong predisposition to activity, desire immediately passes into exertion.

We see from this what is the natural basis of an active energetic will. This consists, first of all, in keenness or intensity of desire. And, since desire stands in the closest relation to feeling, keenness of desire clearly carries with it vividness or intensity of feeling. Strong emotional susceptibilities are thus an antecedent condition of vigorous activity. But feeling in itself is not enough. Many children have strong feelings but no corresponding degree of active force. What is needed over and above this is a powerful disposition to act, or what we specially mark off as the active temperament. The natural foundation of an energetic will thus consists of powerful active impulses sustained by intense feelings. The conditions of the higher manifestations of activity in calm rational volition will appear later on.

Desiring and Willing.—The mere desire for a thing, and the impulse to strive toward its attainment, though the fundamental processes in volition, do not of themselves amount to a full voluntary action. In order that this active impulse may direct itself into a definite line of action another element is needed.

This new factor is the idea or representation of some particular action which we discern to be a means to the object or end which we desire. When, for example, a child desires to amuse himself with a toy, and goes to the cupboard where it lies, or desires to give a pleasant surprise to his mother, and exerts himself in making something pretty for her, we have the selection and adoption of a particular line of activity which is seen to conduce to the desired result. This is a voluntary act in the full sense. The child wills to do a particular thing for a particular end. This adapting of means to ends involves a further effect of experience, which teaches the child that his exertions are definitely related to particular results as the conditions of producing them or the means of attaining them.

Development of Willing.—Having thus roughly analyzed the process of willing, we proceed to trace the main stages of its development.

The growth of willing, like that of knowing and feeling, follows the order, from the simple to the complex, and from the presentative to the representative. The actions of a young child, as carrying objects to the mouth, are comparatively simple movements directed to present or immediately realizable enjoyments. The actions of an adult, such as writing a letter, preparing for an examination, and so forth, are complex chains of movements, and involve an increase of representative power, viz., the ability to picture *remote* ends. Or, to express it in a somewhat different way, action is at first prompted from without, being a response to present sense-impressions (e. g., the sight of food); whereas later on it becomes more and more prompted from within, being called forth by internal processes of imagination and reflection.

Instinctive Factor in Volition.—The growth of the will, like that of intelligence and feeling, implies the existence of certain original tendencies. Every child is endowed at the outset with a number of instinctive propensities which constitute the natural basis of volition. Of these the most important is the general tendency to seek what is pleasurable and avoid what is painful. This is the great primal source of voluntary action. In addition to this general tendency, there are special instinctive impulses toward definite lines of action. Thus there are the appetites or impulses growing out of the bodily needs. It is probable, too, as we have seen, that every individual has an instinctive tendency to display his powers, to requite injury with injury, to seek others' approbation, and so forth. All the main directions of human activity appear to be more or less distinctly foreshadowed by instinctive impulses, which show themselves in the first few years of life.

Effects of Experience and of Exercise.—In the second place, experience and exercise are needed to develop these instinctive germs of volition. Experience is needed to give the child definite ideas of what is good and pleasurable. Even the desire for food, the most clearly marked variety of instinctive impulse, only grows distinct when the gratification of satisfying the appetite has been experienced and can be recalled. And in many cases, as already pointed out, experience is the starting-point of desire. In this way, for example, a child may come to seek the pleasures of a story, of sympathy, and so forth. And while experience is thus needed to teach the child what is desirable, it is needed still more to tell him how he is to compass or realize his desires. The whole work of directing the actions, of adapting means to ends, is the result of a process of learning from experience.

Finally, the exercise of the voluntary powers in any direction is the proper means of strengthening them in that direction. Thus, in bringing the voluntary muscles into play, facility and perfection of execution are reached by means of prolonged and systematic practice. Similarly with the higher moral actions of self-control. The general law of mental development, "Exercise (provided it is suitable in form and quantity) strengthens faculty," holds good in the region of volition.

In studying the development of willing, we shall set out with the simplest form of external action, viz., bodily movement. From this we may pass to other and more complex forms in which the internal element of reflection and free choice becomes more distinct. And with these higher forms of external action may be taken those purely internal manifestations of will which we call the control of the thoughts and the feelings.

Beginnings of Movement.—At first a child knows nothing of his bodily organs or his powers of movement, or of the relation of his movements to the satisfaction of his wants. He has to find this out by actual experiment.

While the human offspring contrasts in its helplessness with the young of the lower animals, it is provided with original and instinctive tendencies to move its limbs, and these are of considerable importance in the development of voluntary movement. These tendencies are transmitted from parent to child by the medium of definite structural arrangements in the nervous system.

Of these the first is the tendency to reflex movement, or movement of a purposeless and comparatively unconscious character, in response to sensory stimulation. Some of these, as the action of closing the fingers around a small object placed on the palm of the hand, appear soon after birth. Others, as blinking when an object is suddenly brought near the eyes, occur later.

Next to these in the order of importance are instinctive movements. These are more complex than reflex movements, and are more like voluntary movements, in being accompanied by feeling and a vague form of desire or craving. Some of these, as the action of sucking, are necessary for the maintenance of the child's life, and so are perfect, or nearly so, at the outset. Others, as baby-singing, pouting when vexed, and so forth, are later.

In addition to these more definite germs of movement, the child manifests in certain conditions a tendency to a wide range and variety of movements. Thus, when the motor organs are reinvigorated after sleep, the infant brings his limbs into play spontaneously. These movements have been marked off as spontaneous or random movements. They are said to be the result of the accumulation and overflow of nervous energy in the motor organs (centers of movements, etc.).

Finally, it is to be observed that all feeling tends to manifest itself in movement. States of pleasure and of pain lead at the outset to a more or less general excitation of the organs of movement.

Transition to Voluntary Movement.—By these several varieties of unlearned movement, and more especially the last group, the child gains some experience of his powers, and learns what are the results of bringing them into play.

In order to understand this, let us suppose that a bright object is held near the eyes of an infant. The gay color delights it, and its feeling of delight vents itself in a number of movements. Suppose that one of these is the stretching out of the hand toward the object. This brings the hand in contact with the thing, and so gives it possession and command of it. Such a result occurring repeatedly would impress itself on the child's mind. It would (by aid of its muscular sense) distinguish this movement from others, and associate or connect with it the gratification of grasping and holding an object. When this stage is reached the movement is transformed into a voluntary one. Wishing to hold an object presented to it, it puts forth its hand for the express purpose of obtaining this satisfaction.[47]

Voluntary movement is thus the outgrowth of trial and experience. The child, by the original constitution of its mind, tends to desire and seek after what is pleasurable and subserves its welfare, and to avoid what is painful and injurious. But this impulse needs to be guided by experience, and this experience is provided for by the primitive tendencies and impulses to movement just spoken of.

Effects of Exercise.—The perfect carrying out of any voluntary movement is the result of a gradual process of learning and improving. The movement must be repeated many times before it becomes definite, so that the child can carry it out promptly and easily. Not only so, repetitions of the movement are needed to fix the association between means and ends in the child's mind, so that the desire for the end shall instantly suggest the appropriate action.

The mastery of a few simple movements prepares the way for the acquisition of new and more difficult ones. For example, a child has learned to stretch out his hands to an object in front of it. A new situation occurs. Sitting on the floor, his toy falls from his hands. By help of his previous experience he has a vague idea of what he has to do to recover it. And by a series of trials he at length modifies the old movement in such a way as to make it fit the new circumstances.

Throughout this progressive extension of the range of movement the child is continually learning to isolate movements one from another, and to combine them in new connections. The first attempts to perform a delicate movement or group of movements, say those of writing, involve a checking of a general or diffused impulse to movement, showing itself in awkward movements of the head, fingers, legs, etc.*

In learning special varieties of finger movement, as in playing the piano, natural or acquired associations of movement have to be overcome. On the other hand, all progress in movement involves construction. The child learns to combine movements already mastered in isolation in new ways. Thus, in learning to write he has to hold the pen in a certain way, and at the same time carry out the necessary movements. The drilling-lesson imposes a combination of muscular actions of the head, arms, etc.

Imitation.—The term imitation is popularly used for the adoption of any movement, feeling, or peculiarity of thought from others. In mental science it is employed with special reference to actions. By an imitative movement is meant one which is called forth directly by the sight of that movement as performed by another. Thus it is an imitative action when a child pouts in response to another's pout.

The imitative repetition of another's observed movement involves an association between the appearance or sight of the movement and its actual performance. The first imitative actions, e. g., pouting, show themselves as

* This is an illustration of the control or inhibition of impulse which will be more fully dealt with in the next chapter.

early as the fourth month; * and this suggests that the associations involved are to some extent inherited. At the same time, the impulse to imitate the movements, gestures, etc., of others grows more marked toward the end of the first year, and only shows itself in its strongest form in the second year. From this it is evident that individual experience is needed to develop the ability. Readiness in imitation is based on a certain range of muscular experience in moving the limbs, and attention to the corresponding visual impressions, the changing aspects of the moving organ.

The strong manifestation of the impulse to imitate at this early period appears to be connected with a growing facility in the performance of bodily movements, and a sense of enjoyment in bringing the moving organs into action. A definite line of action being suggested by another's movement, the spontaneous impulse to activity avails itself of the lead. The contagious character of romping play illustrates this side of imitation.

Later on this impulsive and "unconscious" imitation tends to become a more conscious and definitely voluntary operation. A child at the age of six or eight imitates the actions of others under the influence of a conscious desire to do what others do. The prompting motive here is not always the same. When a boy imitates the bodily feats of another boy, he is impelled by the wish to prove and display his powers, and to show himself equal or superior to another. In other cases the impulse springs rather out of the social feelings, affection and admiration for some one superior to himself, as his parent or teacher.

We see from this the close connection between imita-

* Prof. Preyer says that a child when less than four months old pouted in response to his father's pout ("Die Seele des Kindes," p. 177). This agrees with a remark of Mr. Darwin, that his boy appeared to imitate sounds when four months old. See his "Biographical Sketch of an Infant," in "Mind," vol. ii (1877), p. 291.

tion and sympathy. The latter, as we saw, begins with a contagious propagation of the external bodily manifestations, that is, the characteristic movements by which the feeling expresses itself. And, conversely, the impulses of sympathy, when developed, prompt to a more reflective imitation of the actions of those who are the objects of affection.

So far we have supposed that the imitative movement is a mere reproduction of some action that has been previously acquired independently, as when a child opens his mouth in response to another's movement. But imitation has a much wider range than this. The child imitates new forms of movement. Thus the infant learns to wave its hand in response to the action of the mother. This higher and constructive form of imitation presupposes a certain range of motor experience gained under the pressure of personal needs and desires. A child could not learn to wave his hand in obedience to the lead of another's movement if he had not already acquired a certain stock of experiences in waving his hands in other ways. Similarly, the first effort in vocal imitation, in repeating the words uttered by others, is preceded by a certain stage of spontaneous or feeling-prompted exercise of the organ.

The child's tendency to imitate those about him is a very important aid to the development of his will. From a very early period it co-operates with the force of the child's personal desires, and so tends greatly to shorten the process of acquisition in the case of useful movements which he would otherwise perform. Thus a child thrown with other children who are just able to walk learns to walk more quickly than one cut off from the example of others. And this lead of example tends to suggest a large variety of new modes of movement, and so to extend very much the range of action. We see this exemplified in a striking manner in the rapid imitative acquisition of gestures, vocal groupings, and modifications of accent, tone, etc., of other children and of adults, which often takes place toward the end of the third year.

Children vary much in the strength of the imitative impulse. This is partly connected with unequal degrees of vigor in the active organs. An energetic child will be more disposed to pick up the movements of others than a feeble, lethargic one. Much, too, will depend on the closeness of attention to the visible aspects of movements when performed by the child himself and by others. Finally, the strength of the impulse to imitate others will vary much with the emotional temperament. There are children strongly disposed to fall in with the ways of others, to rely on their authority, and to follow their lead. These are especially imitative. Others, again, of a more independent, self-assertive turn of mind, are apt to strike out their own modes of action. Such are in general much less influenced by example and the impulse of imitation.

Excitation of Movement by Command.—One other mode of external excitation of movement must be glanced at here, viz., that by way of verbal sign and the word of command. This, like the force of imitation, involves a social environment and the action of other human beings. It differs from imitation, since it presupposes a definite purpose to call forth a movement on the part of a parent or other person invested with authority. The association between the act of sitting upright and the corresponding command to do so, unlike that between seeing another do a thing and doing it one's self, is an artificial association which has to be built up by the agencies of discipline and education. This action of authority and discipline is an important factor in furthering the child's command of his bodily organs. The elaborate terminology by which we describe the various moving organs and their several movements enable the educator to specify and isolate in a definite and precise manner the particular muscular action that is required.

Internal Command of Movement. — In all the forms of movement considered so far, action occurs in response to external impressions. A higher stage is reached when movement becomes detached from external impressions, and appears as the result of an internal process of imagination, as when a child thinks of the pet animal in the garden that wants feeding, or the flowers that want watering, and carries out the appropriate movements. In this way movement becomes internally initiated or excited, and so more the outcome of the child's inner self, his thoughts and wishes.

From the ability to perform a particular movement whenever a wish arises for a definite result, the child, by another step upward, attains the power of moving his bodily organs when he wishes to do so apart from any special result. This higher stage of development of movement involves a yet greater degree of facility in the performance of the several recurring forms of bodily movement, and a proportionate readiness to carry them out. When this point is reached the child may be said to have gained a complete internal command of his bodily organs. Henceforth, they will be in a new and higher sense the instruments of his will, made responsive and obedient to the internal wishes and purposes. It is only when he is thus able at will to call into activity his several active organs, and more particularly his arms, hands, and fingers, and his vocal organ, that he is in a position to go on easily and rapidly to new and more complex forms of action.

The progress made in these successive stages of acquiring the command of the muscular organs will vary with the native powers and disposition of the child, and the surrounding influences to which he is exposed. Confining our attention for the present to the former or internal conditions, we may instance among the more important circumstances: (*a*) a vigorous muscular system, with a corresponding readiness to do things, experiment, and persevere in a succession of trials; (*b*) a certain discriminative delicacy of the muscular organs, which favors a nice execution of the several movements; and (*c*), closely connected with the last circumstance, a good retentiveness for movements, which favors the association of them with passive sense-impressions and with one another, and so secures the reproduction of them.

To these natural aptitudes must be added a strong interest in muscular action, and a close and steady concentration of mind on the several forms of exercise. The interest may spring out of the pleasures of muscular activity. But the attainment of the more difficult muscular performances involves other motives, as a love of power, ambition, and so forth. The importance of a steady concentration of mind in furthering muscular progress is one more illustration of the general truth, that all learning, and all mental development, is the outcome of exertion, and is rapid or otherwise according to the intensity and continuance of this exertion.

This attainment of a wide and perfect command of the bodily organs involves the growth of will in more ways than one. As has been remarked, all external actions, including the most elaborate processes of moral conduct, are carried out by means of movements of various kinds. The command of the motor organs is thus a necessary preliminary to the higher kinds of action. Not only so, the very process of acquiring this command of movement implies the exercise in a rudimentary form of the higher voluntary powers, and more particularly persistence in effort and trial, determination to overcome difficulties, and practical intelligence in comparing and choosing between alternatives. Anybody who watches an infant trying to combine manual movements so as to raise or turn over a heavy and unmanageable object, may see how in this early and crude form of action the attributes of the higher volition begin to manifest themselves.

Movement and Habit.—The term habit is commonly used with reference to any recurring mode of mental operation, as when we talk of a "habit of thought." In a narrower and more restricted sense, it refers to a principle or influence operating in the domain of voluntary action.* We do a thing from habit when, as the result of many repetitions, we carry out an action with little consciousness of purpose or attention to the precise form of the action. An action that has thus grown habitual takes on something of a mechanical or automatic character, and so resembles reflex and instinctive actions. Hence, we commonly describe such habitual actions as "instinctive."

As we have seen, every movement tends by frequent performance to grow easy. There remains a "disposition" to perform it whenever it is suggested, and apart from any strong promptings of desire. This disposition implies not only a psychological fact, a greater readiness to perform the particular action, but a physiological fact, namely, a modification of the nerve-structures concerned. This fixed disposition or tendency, produced by repetition and practice, to act in a given way in response to the slightest stimulus, is one ingredient in what we call habit.

The second constituent of habit is the close association between a definite movement and certain external circumstances and impressions. When, for instance, a person on going to bed takes out his watch and winds it up "under the form of habit," the external circumstances, including the sight of the watch, instantly suggest and call forth the action of opening the watch, etc., without any intervention of distinct conscious purpose. This firm connection between an action and the presence of certain external circumstances has for its organic base a co-ordination of the nerve-centers concerned. It repre-

* *Cf.* above, p. 61.

sents the extreme result of repetition in associating and cementing into one invisible whole contiguous mental elements.

When a number of movements are conjoined either simultaneously or successively, the frequent performance of these in combination tends to consolidate the separate links, so that any one tends to call up the others without the need of a separate and distinct voluntary impulse. Thus, when a boy has perfectly mastered a poem, he repeats the appropriate gestures along with certain words in a mechanical way. Similarly, he carries out in a semi-conscious manner the series of movements involved, as those which enter into walking, swimming, dancing, etc.

Strength of Habit.—Habits, like contiguous associations among our ideas, are of very different degrees of strength. The degree of perfection of a habit may be estimated by the promptness and the certainty of the active response to stimulus. Thus the soldier's "response to an order, as 'Attention!'" is "mechanically perfect" when it follows immediately and in every case. The strength of a habit may be estimated in other ways also. It follows from the above account of the mechanism of habit, that it is a tendency to a special kind of action which is physiologically better organized than those other varieties which are accompanied by clear consciousness. Hence, its strength may be estimated by the difficulty of controlling and altering it, and by the degree of discomfort which attends its non-fulfillment.

The main conditions presupposed in a firm or perfect habit are as follows: (1) A sufficient motive force brought to bear at the outset, in order to excite the requisite effort. The will must by an effort of concentration gain full possession of an action before it can hand it over to its subordinate, habit. (2) A prolonged repetition of the action in connection with the appropriate circumstances. Repetition is the great means of fixing movement in the channels of habit. (3) An uninterrupted continuity of performance in like circumstances. The importance of not intermitting the carrying out of an action is known to every parent and teacher. A perfectly firm association leading to an instant and unreflective performance can only be secured by a perfect consistency and uniformity in practice.

It is to be added that the growth of habit is much easier in the early "plastic" period of life than later on. A more extended process of acquisition, a larger number of repetitions, are needed to fix action in a definite direction in later years. Not only so, since the habitual modes of movement acquired in early life, like the first impressions about things, are most lasting and difficult to get rid of, the formation of good habits later on is obstructed by the tenacity of the opposed early habits. A child that has early acquired an awkward way of sitting, or unpleasant tricks of manner, gives special difficulty to the educator. Movement tends to set in the old direction, and many a painful effort is needed to check the current.

Fixity and Plasticity of Movement.—So large a part of our life is a recurrence of similar circumstances and similar needs, that the principle of habit exerts some influence in every direction of our activity. Thus, the actions by which we care for the needs of the body, our behavior before others, and so forth, are properly dominated by this principle. In this way nerve-energy is economized, and the powers of the mind are left free for other matters. Wherever similar circumstances frequently recur and call for like modes of action, the co-operation of the principle of habit is a clear gain.

At the same time, human life differs from animal life in the greater degree of its complexity and variability. The child is not furnished with an outfit of "instincts" to start with, as the lower animals are. Development, as already pointed out, consists in a process of successive modifications, issuing in better adaptations to external circumstances. While, then, the formation of habits is an important part of growth, it is not the whole. Fixity in definite directions must not exclude plasticity and modifiability in others. The complete and absolute rule of habit marks the arrest of development.[48]

Training of Will and the Active Organs.—As already observed, the child's attainment of power to use his bodily organs and perform movements is greatly promoted by the direction of others. The control of the child's actions by the parent begins with exercising him in the use of his muscles. This training of the muscular organs belongs in part to what is called physical education. The well-known effects of muscular exercise in promoting the general circulation of the blood and the maintenance of bodily heat give it an important place in the educator's study and furtherance of the health of his pupils. The prominence given to the general development of the muscular frame by kindergarten exercises, gymnastics, and the encouragement of out-of-door games, points to the recognition of the dependence of the general health and mental efficiency on muscular development. To this it must be added that in its more advanced forms, involving special practice and skill, the exercise of the muscular powers is carried out for the sake of attaining a special bodily excellence, viz., robustness, and agility of limb.

At the same time, the exercise of the active organs is in a measure involved in intellectual education. This applies more particularly to the training of the hand and the voice. Teaching children to speak distinctly, to read, and to write, is commonly looked on as a part of intellectual instruction. It is obvious that these actions largely subserve the ends of knowledge, and are indeed necessary to the taking in and giving out of knowledge. In more special directions, as the exercise of manual dexterity in drawing, this training aims at the production of some useful and technical skill.

While the exercise of the active organs in special directions thus falls under physical or intellectual training, the exercise of them in the carrying out the ordinary actions of daily life comes more appropriately under the head of moral training. As we have seen, the growth of the will begins with the attainment of the power of commanding the organs of movement. It is in movement that clear purpose and intention first display themselves. All practice in doing things, then, whatever its primary object may be, is to some extent a strengthening of volitional power.[49]

In assisting in this early stage of will-development the educator should bear in mind that children are disposed to activity, and in their self-appointed occupations and play show that they are capable of making real progress without any direct control from parent or teacher. The young child should from the beginning have ample opportunity for exercising his active organs freely, with only a general supervision and an imposition of a few necessary restraints. His nursery and his play-ground should be provided with objects fitted to call forth movement, manual and bodily. The important part played by imitation, in the growth of voluntary movement, suggests the advantages of companionship in these early occupations. A child is stimulated by the sight of others doing some new thing. Not only so, in all common harmonious movements, as those of many social games and kindergarten exercises, a new pleasurable stimulus is supplied in the feeling of sympathy, co-operation, and harmonious adjustment.

The special province of the educator in this rudimentary training of the will begins with showing the child how to do things. This requires judgment. It is better for children to find out the way to do a thing for themselves where they can, just as it is better for them to discover a fact or a truth for themselves. Nothing is more fatal to growth of will than that indolence which shrinks from the effort of trial and experiment. Consequently, the educator that is always interfering with children's play in order to instruct and show them how to do things, is losing sight of one of the most important conditions of development, viz., self-activity.

As the child grows, his actions come more under the control of the educator. The parent has at an early stage to bid the child sit at table and hold his spoon in a certain way, articulate his words distinctly, and so forth. And to this home instruction there adds itself later the more systematic training of the school. In the bodily performances of the kindergarten, the manual exercises of drawing, writing, etc., and the employment of the vocal organs in reading and singing, the teacher becomes the trainer of the child's muscular powers in various lines of orderly constructive activity.

The object to be aimed at in all such exercises is to train the child to the best possible use and management of his organs of movement. The ideally perfect action is one which is fully adequate to the purpose in hand, and at the same time involves no unnecessary expenditure of force. Hence the teacher should aim first of all at adequacy and thoroughness of performance, even in such apparently trifling actions as hanging up the hat. And in the second place he should seek to correct all clumsiness in the use of the muscular organs, and to develop a facile precision of movement, which is at once an economy of force and the source of what we call grace in movement.

In building up such perfect bodily acquirements a number of conditions have to be satisfied. To begin with, the educator must be careful as to what he insists upon. The task must not be above the child's strength of muscle, or the degree of discriminative delicacy attained. The teacher should remember that movements which have become easy and natural to us by long practice involve much difficulty at the outset. Care must be taken to proceed gradually, and to make the elementary movements perfect before going on to complex groupings of these.

It is not meant by this that the child is not to be called on to make a serious effort. The exercises will only be a training of the will in so far as they call forth such effort. The child's indolence and disinclination to the irksomeness of a sustained concentration of mind on a movement or series of movements should be overcome. And here an appeal to some motive other than the mere pleasure of activity will often be needed. The child's desire to get on, to do things as well as those a little in advance of him, and wish to please, will suffice to prompt the initial effort.

Finally, the educator should remember that every perfect action is a habit, and that its realization depends on the fulfillment of the general conditions of the formation of habits. A gentle firmness at the outset, followed up by a uniform insistence on the repetition of the action in the appropriate circumstances, is what he has to take special care of here. When these initial conditions are fulfilled, the educator can trust for the final result to that valuable ally, the principle of habit itself, which unfailingly works toward the transformation of oft-repeated actions into self-sustaining and "natural" ones.

The careful graduation of work according to capability may be illustrated by the method of teaching deaf-mutes to speak by a process of imitative movement. The teacher begins with movements of the external parts of the body, which are distinctly visible to the child when he himself performs them, and as a consequence easier of imitation. Only after a certain practice of the imitative capability in this simple form does he venture to go on to call forth the more delicate and hidden movements of the organs of articulation, which can not be guided by sight, and have to be taught by the aid of the sense of touch.

APPENDIX.

On the early development of will in voluntary movements, see Perez, "The First Three Years of Childhood," chaps. ii and vii, and Preyer, "Die Seele des Kindes," 2. Theil. On the relation of bodily training to education, see Waitz, "Allgemeine Pædagogik," § 7; Dittes, "Grundriss der Erziehungs und Unterrichtslehre," §§ 13 and 14; and Compayré, "Cours de Pédagogie," leçon ii.

CHAPTER XX.

MORAL ACTION: CHARACTER.

HAVING in the preceding chapter traced the steps by which a child acquires the command of his moving organs, we may pass on to consider the higher developments of will, in which action becomes more reflective, and aims at other results than immediately realizable gratifications.

In order to understand how this more rational type of action arises, we have to trace the effect of two influences: (*a*) that of the growing intelligence of the child; and (*b*) that of the fuller and wider development of the feelings and desires.

(a) Influence of Growing Intelligence.—The early type of action, that represented by bodily movement, aims at an immediate result. The young child can not aim at a remote gratification, say the pleasure of winning a prize at some distant date. And this because he has little representative power, and can not steadily picture a remote gratification, or see its connection with a present action. The growth of intelligence supplies this ability. A child gradually learns that his actions have remote consequences, e. g., that an act of disobedience today may bring him deprivation to-morrow.

This growth of knowledge and representative power will show itself in different ways. (*a*) Thus a child will come to aim at secondary ends, that is, objects which, though not valuable in themselves, are the means of attaining what he desires. In this way he first acquires the habit of obeying his parents and teachers, of putting things by for future enjoyment or use, and so forth. (*b*) As a further result of growing intelligence, the child learns to aim at what we call permanent interests or ends, such as health, knowledge, and the love and esteem of others. He finds that excessive indulgence not only brings discomfort now, but may prevent his growing strong by and by; that neglect of study to-day leaves him permanently less intelligent than he might be, and so forth. In other words, he recognizes the fact that there are permanent forms of good which can only be secured by a prolonged and consistent direction of activity.

(b) Influence of Growth of Feeling.—In the second place, the volitions of the child are developed by the extension of the range of the desires. This is effected to some extent by the growth of secondary desires, that is, desires for objects, as health, property, and reputation, which are originally sought as means only. The boy's desire to be rich springs up in the first instance through an imagination of the many pleasures he could obtain by riches. But from being pursued as means of enjoyment, such things tend to acquire a value in themselves.

The chief agency, however, in extending the range of desire is the growth of new feelings. As already pointed out, the instinctive germs of desire have to be supplemented by experiences of what is pleasurable and painful. And as the emotional nature unfolds, new forms of desire spring up. Thus, to the early motives of infancy, the bodily satisfactions, the pleasures of sense, and the delight in activity, there are added the pleasure of competition, the love of approbation, and the desire to please, and so forth. And finally, there appear as new springs of action the desire for knowledge and the love of duty. By these successive developments of the feelings new motives are supplied, and action is prompted in a larger number of directions.

Complex Action.—A necessary result of this growth of intelligence and expansion of feelings and desires is that action grows more complex in respect of its originating impulses or motives. Instead of being prompted by a single desire, it is the outcome of a number of desires. This compositeness of impulse may assume one of two forms—(*a*) co-operation of impulses, and (*b*) opposition of impulses.

(*a*) By a co-operation of impulses is meant the combining of two or more desires in prompting action in one and the same direction. Thus a child may carry out an action partly to gain some personal satisfaction, and partly to please his parent or teacher. A strong bent to activity, with its connected love of exerting the active powers, leads to a frequent performance of actions under a double impulse.

(*b*) The more important case of composition of impulses is that in which they oppose one another. Here two or more desires prompt to different courses. Thus, a child may feel impelled to indulge in a forbidden pleasure, and at the same time feel deterred by a fear of punishment. Or he may feel attracted to two incompatible lines of action, as play and study.

Deliberation and Choice.—This opposition of impulses supplies the occasion for a new and higher manifestation of will. The presentation to the mind of two alternative courses calls for a preliminary process of reflection and choice.

In order that this operation may be carried out, a severe exertion or an *effort* of will is needed at the outset in checking or restraining the impulses to action. To reflect whether it is desirable to gain a satisfaction at the cost of some penalty, or which of two pleasurable ends is the more valuable, implies that the mind has for the moment mastered the tendency of impulse to work itself out into external action.

When this first step is secured, the mind has to represent each end distinctly and steadily, and compare the two one with another. Here the moral *judgment* is called on to compare and measure things in respect of their value and their bearing on the individual's happiness.

The outcome of this process of deliberation is a decision in favor of what the mind judges to be the more worthy and desirable. This is called an act of choice. It involves the discrimination of one thing as better than another.

The ability thus to check impulse by deliberation is the characteristic of a fully developed and enlightened will. Its attainment is a slow process, which only begins in the first years of life. Children with their strong inclination to act find it hard to defer decision. And where a conflict of impulses occurs they are unable to master the turbulence of the conflicting desires. Hence we often find that the conflict resolves itself by the more powerful impulse working itself out, or that the child abandons the problem of deciding in a state of impotent despair.

What is needed for the attainment of this power is first of all a certain experience of the evils of hasty action, and a power of retaining and recalling these. The disposition to deliberate presupposes that the child fears to act rashly. Some children are specially retentive of such evil effects, and so acquire this cautiousness much sooner than others. In the second place, the child's practical intelligence needs to be exercised and strengthened so that he may gradually acquire readiness in comparing actions, and judging with respect to their wisdom and rightness.

Resolution and Perseverance.—One further outcome of this higher volitional development is what is known as resolution. This term implies a fixed determination to do something before the actual moment for performance arrives. The formation of a resolution involves reflection beforehand, and so a more elaborate preparation for action. Thus a child that resolves to tell his mother that he has broken something must be capable of looking ahead and distinctly representing a set of circumstances, the meeting with the mother, her questioning him, and so forth.

All the more difficult and prolonged processes of action involve resolution. To keep steadily possessing an end through a series of means implies a firm hold on the object of desire and a fixed determination to attain it.

While the power of deliberating and choosing gives reasonableness to our actions, that of persevering in our decisions gives firmness or stability. Children are in general wanting in such firmness, just as they are wanting in stability and consistency of judgment. A child's decisions are apt to be determined by the circumstances of the moment, and to alter themselves in an amusing way as the influences of the moment vary. The child's mind, being "weak in futurity," is incapable of the range of mental vision involved in a far-reaching resolution.

It is important to distinguish firmness of purpose and stability of will from obstinacy. Firmness clearly involves a measure of independence, a readiness to assert our individual decision over and against the persuasions of others. At the same time, as in the case of judgment, so in that of voluntary resolution, there may be an excess of independence, leading to a foolish rejection of advice and persuasion from others. This is known as self-will or obstinacy. It is distinct from a genuine firmness that reposes on calm and enlightened conviction, and has its main support in a love of self-assertion and a defiance of others. This applies to a good deal of childish obstinacy, though it is probable that resistance to persuasion and authority is often the outcome of a sincere childish assurance of the soundness of their decisions.[50]

Self-Control.—The exercise of the powers of reflection and rational choice lead on to what is called self-control. By this is meant the power of checking and bringing under the earlier and lower impulses, and subordinating these to the pursuit of higher and worthier ends. Self-control implies the development of a higher motive—higher, that is, both in the order of development and in ethical value—and the supremacy of this over a lower volitional force. It implies, further, the development of practical intelligence and the ability to deliberately prefer a more worthy satisfaction to a less worthy.

(*a*) **Control of Impulse.**—The acquisition of the power of self-control may be traced through a number of ascending stages.

The simplest and earliest form is where some actual or immediately attainable gratification is abandoned for the sake of some greater satisfaction, or of the avoidance of some greater dissatisfaction in the future. This is illustrated in the effort of an indolent child enjoying its laziness to set about some prescribed task, and of a greedily-disposed child to give up the present satisfaction of eating his sweets in order to enjoy them on the morrow.

A higher stage of self-control is reached when the child's intelligence seizes the idea of permanent ends, as bodily strength, knowledge, and reputation. The region of action now becomes more perfectly ordered by a subordination of particular momentary impulses to enduring interests. Thus a present inclination to disobey is controlled by the desire for the lasting affection and good opinion of the parent or the teacher.

A yet higher degree of co-ordination of desires, and of the reduction of the first chaos of impulses to order, is reached when the child's powers enable him to compare his several interests one with another, and to recognize their relative value as constituents of his total happiness. When this point of development is attained, the child will control the impulse to pursue the ends of popularity, intellectual eminence, and so forth, by a reference to a higher principle of action, viz., the attainment of well-being.

The last and crowning stage of this process of subjecting impulse to principle is seen in the subordination of the individual interests to the common good. To aim at the happiness of others is not natural to the child. The disposition to do so has to be gradually built up. The readiness to postpone his own happiness to the claims of others presupposes a development of the social feelings and of the moral sentiment.

(*b*) **Control of the Feelings.**—In addition to this control of impulse and action, self-control includes the mastery and regulation of other forces.

Of these, the first is feeling. As we have seen, the feelings immediately vent themselves in physical actions, and among these the movements of the voluntary muscles, those of the face, arms, etc. The control of feeling is thus in a measure similar to that of impulse. The first thing a child has to do in checking the force of angry passion is to check or inhibit the external actions, such as crying and throwing the arms about. Since, moreover, feeling and its bodily expression are closely connected one with another, it follows that this arrest of external action will tend to some extent to allay the feeling itself. By making an effort to repress the signs of grief, the child may succeed in diminishing the force of the feeling of misery itself.

What the exact effect of the restraining of the external manifestation of a feeling will be in any given case depends partly on the strength of the feeling. If an emotion, say of anger, is very intense, the suppression of its external signs may do but little to stifle the feeling itself.

The mind may sulkily indulge its passion internally by brooding on ideas of satisfaction. The result of such external self-restraint will vary too with the temperament of the individual. Children whose feelings are slow to excite and slow to allay are specially liable to this secret smoldering of passion. Hence the need of some additional means of restraining feeling. This will be spoken of presently.

The due control of the feelings has a high moral significance. In what is called good-breeding a certain amount of emotional self-restraint is involved. The higher moral quality of considerateness implies a wider and more vigilant self-control, viz., the repressing of all feeling that would offend others. Once more, the moral quality of endurance includes the power to check the manifestations of suffering, to preserve a bodily calm when pain agitates the mind.

The acquisition of the power of controlling feeling is a difficult and slow process. Children's feelings are characterized by their great intensity, and their complete possession and mastery of the mind. Hence the effort to check the outgoings of passion is a severe one. It is to be remembered, too, that the motives which prompt to such efforts of self-control, e. g., a regard for our own comfort, and the sense of what is seemly and right, are late in their development. At the same time children should at an early age be exercised in the easier tasks of self-control. Thus, as M. Perez points out, a child of fifteen months may be led to stop its crying when addressed in a loud voice.*

(*c*) **Control of the Thoughts.**—The other great region calling for the control and regulation of the will is that of the intellectual processes. As was pointed out above, apart from this control the child's attention is drawn hither and thither according to the external excitants

* *Op. cit.*, p. 108.

present at the moment, and the succession of the thoughts as determined by the forces of association. The control of the thoughts involves the checking and counteracting of these tendencies, with a view to direct the attention in some special direction.

This control of the intellectual tendencies involves a special effort of will. The child's first attempts to turn away from all distractions and keep his mind resolutely fixed on a subject indicate, by their bodily accompaniments, e. g., wrinkling of the brows, fidgety movements, the presence of a painful effort. In order to the making of this effort a strong motive force is needed, such as the fear of disgrace or the desire to gain knowledge. The stronger the effort required, the more powerful must be the motive.

Throughout the development of intelligence this control of the intellectual forces by the will has been assumed. Thus careful and fruitful observation presupposes the ability to keep the attention concentrated on one object for a time, and to resist the natural tendency of the mind to flit from one object to another. Again, in learning or committing something to memory, as also in trying to recall what has been learned, the will is called into play in the form of a deliberate concentration of the mind on a special subject or group of ideas. Finally, in the processes of constructive imagination, and of abstraction and reasoning, this power of turning the attention away from what is interesting, and of resisting the forces of suggestion, is called into exercise in a yet higher form.

Different Forms of Self-Control.—While thus dealing separately with the control of impulses, of the feelings, and of the thoughts, we must remember that they are closely connected one with another. More particularly we may say that the control of the thoughts is involved in that of the feelings, and that the control both of the feelings and of the thoughts is involved in that of impulse and action.

(1) As has been observed, every emotion is excited by, and so depends upon, some mode of intellectual activity, as looking at what is dreadful, or recollecting some injury. Hence, to control the thoughts is one means of controlling the feelings. It was pointed out just now that we can only very imperfectly repress feeling by checking the accompanying external movements. The only efficient way of reaching and mastering the force of feeling is by turning the thoughts from its exciting cause, and directing them to something wholly foreign and unconnected. A child's feeling of disappointment is only fully controlled when by an effort of will he turns his thoughts in some other direction. The beginnings of moral training in this direction should aim at the repression of feeling by a withdrawal of the mind from its exciting cause.*

(2) Again, since feeling and thought are both involved in action, the perfect control of the active impulses includes the control of these. Thus the impulse to do an unkind action is only completely overcome when the feeling of anger out of which it springs is repressed, and the remembrance of the injury which excites the feeling banished from the mind. Hence the importance assigned by moralists to the control of the desires and thoughts "of the heart."[51]

Habit and Conduct.—The principle of habit, the application of which to the region of voluntary movement has already been considered, reigns in the higher region of moral action or conduct as well. The processes of deliberation and control just described only attain to a

* Dr. Sikorski gives an interesting account of how he began to habituate an infant to bear the discomfort of hunger by interesting it in the details of the process of preparing food. ("Revue Philosophique," May, 1885, p. 540.)

perfect form when they become fixed by the law of habit.

The fundamental fact emphasized by the word habit is that all actions become more perfect by repetition. Just as bodily movements, at first tentative, unsteady, and involving effort, come by repetition to be certain, steady, and easy, so the higher exercises of the will in the arrest of impulse and deliberation tend to grow more perfect by steady pursuance.

At first the child, when his action is arrested by an apprehension of evil consequences, is apt to be overpowered by the contending impulses, and is incapable of decision. But after he has once made a serious effort to end the state of conflict, and decided to act according to reason, he has taken an important step in moral development. The next time a collision occurs reflection and decision will be easier. The vehement forces of impulse will have been reined in to some extent. Every new exercise of the power makes the pause, the consideration, the final calm decision a less arduous exertion. The whole process grows smoother, involving less and less of the friction of effort, till as a final result reflection and deliberate choice become easy and natural.

Moral Habits.—The same principle of habit has further and yet more striking results in the region of moral action. The subordination of a lower impulse to a higher motive, which at the outset involves a painful effort of arrest and reflection, tends by repetition of the exertion to grow less and less difficult and irksome. Thus each restraint of greed from a consideration of its evil effects, or of selfish propensity for the sake of others' good, tends to fix action in this particular line. That is to say, the higher moral force gains ground as a ruling disposition, and encounters less and less resistance. The outcome of this process of growth is a perfect moral or virtuous habit, which implies a firm disposition to seek a definite species of good, as health, and in its more intelligent form a willing adoption of a general principle or maxim of conduct, as "Obey the laws of health."

The conditions of the formation of habits already pointed out have to be satisfied here. The initial effort must be secured by a strength of motive sufficient to overcome the difficulty of the action and the disinclination to what is irksome. In the second place, there must be perseverance and an uninterrupted following up of the first success till the principle of habit fixes the moral acquisition. And in order to this the will must not in the early stages be exposed to too powerful a temptation.

Character.—The term character is often used loosely to denote individual peculiarities of mind, whether intellectual or moral, and whether showing themselves at the outset as strongly-marked innate tendencies, or later as the result of experience and education. In a narrower and more accurate sense it signifies the acquired results of individual volitional exertion, such as intelligence, insight, independence, and firmness of will.

Since moral attainments, viz., good dispositions and habits, are the most valuable result of such volitional exertion, the term character has come in ethical and educational works to denote in a special way a good or virtuous disposition of the feelings and of the will. A person of character in this sense is one who can be counted on in general to decide and act wisely and rightly.[52]

This moral or virtuous character is the resultant of the several forms of self-control carried to the point of perfect habits. Thus a perfect moral character includes the familiar habits involved in a wise pursuit of individual good, such as industry, orderliness, temperance, the habitual control of the feelings or moderation, and the firm control of the thoughts involved in reasonableness. It includes further the habits implied in a perfect fulfillment of human duty, as obedience, courtesy, veracity, justice, and beneficence.

It is commonly said that moral character is a bundle of habits, such as is here roughly sketched out. This is an important definition of moral character, since it brings out the essential ingredient of fixity of disposition in right directions. At the same time it must not be thought that a perfect character shows itself in a habitual and quasi-mechanical pursuance of a number of detached ends or forms of good. Self-control aims, as we have seen, at co-ordinating and harmonizing the several desires and ends one with another, subordinating them to some supreme end or ideal of good ; and a perfect character includes a disposition to reflect and deliberate when occasion requires, e. g., where there is an apparent conflict of duties, in order to determine what is the more worthy form of good, and where the path of duty exactly lies.*

External Control of the Will.—So far we have assumed that the child's will develops spontaneously without any direct control and direction from without. It is evident, however, that the acquisition of the power of reflection and of the moral habits is greatly furthered by the action of others, and especially those who exercise authority over the child. As we saw in tracing the growth of the moral sentiment, the influence of authority and moral discipline is a necessary condition in the formation of that sense of duty, the supremacy of which marks the highest stage of self-control. A mere glance, moreover, at the circumstances of early life tells us that the actions of the child are regulated and determined to a considerable extent by the wishes and commands of others. This fact is recognized in the saying that the first stage in the

* "Virtue can never become a sum of habits, and for this plain reason : there is not a single good habit except the habit of being good (i. e., of a good will) that may not conflict with real duty at some point or other." (Mrs. Bryant.)

development of moral habits is the learning of obedience.

The training of the child's will by the moral educator proceeds partly by way of the restraints of authority and command, and partly by way of suasion, advice, and enlightenment.

Authority and Obedience.—The action and effect of moral discipline presuppose the existence of some authority. The discipline of early life is dependent on the fact that the parent or other guardian of the child is invested with certain powers of government. By these are meant the power to lay down commands, and to support and enforce these by the sanctions of punishment. By so doing he can require the performance of certain actions, such as those involved in industry, orderliness, etc., and also prohibit other actions which he holds to be undesirable, as acts of rudeness and personal violence.

While moral discipline is thus based on the power to enforce obedience by punishment, it must be carefully distinguished from external compulsion. The physical coercion exercised by the slave-owner or the brutal parent is not, strictly speaking, a moral force at all. The threat of immediate physical suffering of an intense kind produces the agitation of terror, which paralyzes the will. A mechanical compliance follows under the overwhelming force of dread, but this is not conscious and willing obedience to authority.*

Once more, the relation of authority to obedience can not be said to exist where commands are laid down in such a way that the subject is able to coolly balance the pleasures and pains of disobedience, just as he would balance those of a strictly private and personal act. In such a case the will is undoubtedly called into play in the

* See what Locke says on the effect of corporal punishment and "slavish discipline" in breeding a "slavish temper." "On Education," §§ 50, 51.

processes of deliberation and choice. But the effect is not strictly a moral effect.

True obedience to authority rests on an acknowledgement on the part of the governed of the moral, as well as the physical, superiority of the governor. Only where there is this feeling can there be an act of self-control properly so-called, that is, a conscious subordination of a lower impulse to a higher principle of action. This attitude of self-submission to authority presupposes, on the one side, the position and qualities fitted to call forth respect, and, on the other, a disposition to reverence and bow to mental and moral superiority.

In the case of young children this sense of authority is partly instinctive, partly the result of an apprehension of a special relation of dependence on the parent or other guardian, and partly the product of the daily experience of his wisdom and goodness. The effect of custom and special association with a person in developing this feeling is seen in the familiar fact that a child that is habitually submissive to his parent or nurse will violently resent the assumption of authority by a stranger.*

While in its earlier forms the respect for authority which prompts to obedience is largely a feeling for a person, it gradually becomes a more intelligent appreciation of the moral function of the ruler as the representative and upholder of the impersonal moral law.[53]

The Ends and Grounds of Early Discipline.—It is commonly allowed that children are the proper subjects of authority and command. Their ignorance and incapacity to decide about things necessitates the laying down of certain commands by those who have charge of them. These commands have as one of their ends to preserve the child from the evil effects of his ignorance and want of foresight. The commands of the nursery, as not

* For an illustration see Perez, "The First Three Years of Childhood," p. 291.

to play with the candle, and so forth, aim at warding off physical harm. That such prohibitions are necessary will be generally allowed. To leave children altogether to the "discipline of consequences," in the shape of Nature's penalties for violating her laws, would be too dangerous an experiment for an affectionate parent to undertake. And even later on, the child needs to be guarded against physical evils, e. g., those resulting from overindulgence in the pleasures of the table.

But the institution of early discipline has other ends and uses. As *moral* training it aims at leading action into right or virtuous channels, in building up good moral habits, and forming the character.

That some external control of the child's action by discipline and restraint is necessary for moral purposes, will probably be conceded. The most optimistic view of childish nature must recognize the existence of natural impulses, e. g., greediness and covetousness, which require firm restraining. Nor can it be safely contended that the natural consequences of wrong actions in the loss of the parent's society and confidence can be counted on in the first years of life to deter from such actions. And even were such natural penalties sufficient to deter the child, they would not tend to develop a truly moral disposition toward right conduct. As already pointed out, an indispensable step in the formation of a sense of duty is the assertion and exercise of authority over the child, the making him feel that there is a higher will over his which he has to obey.

It may be safely contended that obedience, in the sense already defined, is in itself a moral habit, forming indeed one chief virtue of childhood. A readiness to repress personal desire, in deference to a command that is felt to be authoritative, can only be acquired by a certain amount of effort of will and reflection on the true value of things.

Nevertheless, it is a common and fatal error to regard obedience to personal authority as an end in itself. The ingredient in childish obedience which constitutes it a moral exercise is the dim apprehension of the reasonableness and moral obligatoriness of what is laid down. And the ultimate end of moral discipline is to strengthen this feeling, and so transfer the sentiment of submission from a person to a law which that person represents and embodies. It is only when this finer and higher obedience to law or principle is reached that authority can be said to have done its work. Commands are a scaffolding which performs a necessary temporary function in the building up of a self-sufficient habit of right conduct.

Conditions of Moral Discipline.—By a moral discipline we mean a system of moral rules, properly laid down, understood, and enforced. The first condition of such a system is the imposition of *general* commands or rules for acting. The exercise of authority in prohibiting isolated actions is not discipline. A mother who says "Don't do that," and who visits this and that particular action with a slap or a "Naughty child!" without making clear what it is in the action that is prohibited, is not a moral ruler at all. A ruler is an imposer of general rules, which direct the subject how to act in a certain class of cases.

In order that a rule may be operative it must satisfy one or two main conditions. (*a*) It must refer to an action that the child may reasonably be expected to be able to perform, and that the ruler is sure of being able to exact. Thus, as Miss Edgeworth remarks, prohibitions, e. g., "Do not touch the lamp," are more easily enforced than positive requirements, as, "Stand up."[54] (*b*) The rule must be intelligible. If, for example, a child is told not to tell stories, without having a clear idea what this means, it can not produce any moral effect. (*c*) It must be uniformly enforced. Only so will the necessary strength of association between action and penalty be produced. When a rule is deviated from, the child can not feel its sovereign authority as a moral command, and is moreover disposed to decide to obey or disobey by a process of purely prudential calculation. These conditions are essential to the formation of a habit of perfect and unhesitating obedience.*

As already pointed out, a fixed moral habit needs a firm application of a sufficient strength of motive at the outset, and a constant following up of the requirement. Hence the importance of laying down the command in the most impressive and authoritative manner, and seeing that it is never disobeyed in any single case.

Since the learning of obedience to any rule is a matter of time, it is of the greatest consequence not to lay down too many at once. "I have seen," says Locke, "Parents so heap *Rules* on their Children, that it was impossible for the poor little Ones to remember a tenth Part of them, much less to observe them."

Punishment.—As already observed, authority and command presuppose the power to punish. By punishment is meant the intentional and deliberate infliction of pain of some sort by one invested with authority, and as a consequence of an act of disobedience.

It follows from this definition that a natural consequence of an action, e. g., a fall resulting from a forbidden act of climbing a ladder, is not punishment. Nor is all suffering that issues from the person in authority punishment. Thus the natural loss of confidence and affection that follows a discovery of a child's falsehood is not, strictly speaking, punishment. Still less is any outburst of spiteful retaliation at the personal annoyance arising from a child's disobedience. "It is," says Waitz, "the first condition of the proper effect of punishment that it should be apprehended and felt by the child as punishment."

* To this it may be added that the rule should, so far as possible, be recommended as reasonable and necessary, so as to prevent its being viewed as a capricious and vexatious restriction.

It has already been implied that punishment, actual or potential, is necessarily implied in any system of moral discipline. Punishment has two chief ends: (*a*) the correction and improvement of the individual offender, and (*b*) the instruction and benefit of others by way of example and warning. These ends are not always equally prominent. In the penalties inflicted by the magistrate the deterring effect on others is the chief thing considered. With the educator of the young the reformation of the individual is the first and supreme consideration. In the home this is the chief thing aimed at, though effect on others is not wholly lost sight of. And in the school this last consideration becomes more distinct, without, however, becoming the ruling consideration, as in the case of the State.

At the same time it is evident that punishment by inflicting pain on the child is in itself an evil. Hence it is generally acknowledged that it can only be justified when it is necessary for the realization of the ends for the sake of which it is instituted.

The evils of punishment from an educator's point of view are numerous and serious. (1) It is a form of suffering, and so opposed to the humane purposes of education. (2) It tends to estrange educator and learner, and to render the latter indisposed to ally himself in sympathy and co-operation with the former. (3) By acting through the instinctive fear of pain it has no stimulative force in it beyond the point exacted. In this way it is immeasurably inferior in its action to pleasurable motives, as the wish to please, or the love of study. These objections apply to all punishments alike. To this must be added that certain forms of punishment are apt to produce bad moral effects by overhumiliating and degrading the child.

There are certain plain limits to the use of punishment. Thus it ought not to be resorted to when through weakness of will a child is incapable of doing a thing. The object of punishment, so far as corrective of the delinquent, is to supply a new moral force which may suffice to counteract a natural inclination to wrong-doing.

And if the punishment does not supply such a force, through feebleness of will, it is useless and therefore cruel. Thus to punish a child overpowered by grief for not instantly controlling its feelings is barbarous. Again, no action is a proper subject for punishment which is not clearly wrong in its intention. Hence to punish a child for breaking something through an ordinary childish carelessness is immoral.

Proportioning of Punishment.—Not only does it need much care to determine what cases are meet for punishment, it requires much consideration to fix rightly the amount of punishment in particular cases. Here a number of considerations have to be taken into account. Thus, so far as the punishment is intended to deter others, regard must be had to the degree of harmfulness of the action, and of the moral turpitude it implies, also to the secrecy of the wrong action, and the consequent difficulty of detecting it. And, so far as it aims at correcting the wrong-doer himself, the punishment must be determined by a careful reference to the circumstances of the case, so far as aggravating or mitigating the offense, and also to the known sensibilities and moral character of the child, so that enough and not more than enough supplementary force may be applied to correct the wrong action.*

It follows that the moral educator can not make known beforehand, except in general terms, the precise amount of punishment that will be incurred by a given class of offense. Nor is this desirable. On the contrary, a precise foreknowledge of the amount of suffering would favor that prudential estimation of the evil of punishment which it is one chief concern of the educator to avoid.

* Dettes distinguishes between the problem of dealing with wrong actions that are done clandestinely in order to evade punishment, and that of handling acts of open defiance ("Erziehungs- und Unterrichtslehre," p. 183). On the proper proportioning of punishment to offense, consult Waitz (*op. cit.*, p. 179, etc).

While judgment and insight are thus needed to fix the amount of punishment in any case, they are further required for determining the most appropriate *kinds* of punishment. Here it is important to choose some mode of pain which, in the first place, is little affected by individual differences of sensibility, so that it can be administered justly in the case of all children alike; and, secondly, which easily lends itself to quantitative estimation and gradation, so that it may be varied in quantity according to the circumstances. To these prime considerations may be added that that mode of punishment is to be preferred which is in its nature appropriate to the offense, or, as Bentham has it, "characteristical," e. g., confinement during play hours for previous neglect of work.*

Reward, Encouragement.—Punishment, being a mode of pain, deters from action rather than excites to activity. Even where it is employed as a stimulus to action, as when a child is punished for not preparing his lesson, its depressing influence is still seen. The little delinquent feels himself forced to be industrious, and his activity is in consequence put forth without heartiness, and even grudgingly. Moreover, as a mode of pain, the fear of punishment, though undoubtedly a potent motive, has only a restricted range. As soon as the exacted quantity of task-work is done, the pressure of the motive ceases.

Moral discipline includes not only the checking of impulse by deterrents, but the stimulating of activity by positive inducements. That is to say, it makes use not merely of the child's natural aversion to pain, but of his equally natural and more far-reaching desire for pleasure. It may be a question how far such artificial stimuli are necessary or desirable. Where it is possible it is no doubt well for a child to be industrious, good, and so on, for the sake of others' good opinion and love. But the weakness

* On the rule given by Bentham for proportioning punishment to offense, see Bain, "Education as a Science," p. 106, note.

of the social feelings in children makes some amount of artificial stimulation necessary in the early stages of moral training.

In administering rewards much caution is needed if moral development is not to be retarded instead of being advanced. To begin with, nothing is worse than bribing a child to do a thing which he ought to be required to do by a sense of duty or, if need be, a fear of punishment. To promise a child something, for instance, if he will stop crying or if he will speak the truth is demoralizing.*

The main condition of the moral efficacy of a reward is that it is conferred on merit, that is, as the result of some exercise of virtue over and above what can be rightfully insisted on as obligatory. The more clearly it is made evident that the reward is thus a recognition of a genuinely virtuous act, the more powerful its effect. It follows that the word of praise or the tangible recompense should not appear to the child to be the mere outcome of personal affection and tenderness on the rewarder's side, but as the authoritative acknowledgment of desert.

It follows from this definition of the aim and function of rewards that they ought not to be too frequently bestowed. A frequent and lavish bestowment of rewards is fatal to the association in the child's mind of recompense with real merit. It favors the view that he has a right to the reward.†

Judged by their moral effects, some kinds of reward are superior to others. Gifts and material rewards generally, by appealing to children's lower feelings, have a much smaller moral value than praise or commendation, that

* As Waitz observes, rewards are in certain respects more dangerous to morality than punishments; for these at most produce fear of evil, while those make the positive stimulus of desire for pleasure the motive to duty (*op. cit.*, p. 185).

† As Waitz observes, it is well sometimes to reward a child unexpectedly, and not to let him count on a definite reward beforehand.

gratifies the higher feelings, love of approbation and affection. It is hardly necessary to add that rewards, like punishments, must be graduated to the degrees of merit, and as far as possible made appropriate to the nature of the virtuous act.

Where, as in the school, rewards are given as prizes for successful competition with others in intellectual pursuits, the moral effect becomes very much circumscribed. As already pointed out, the impulse of rivalry tends to be anti-social, and the eager competition for prizes has a baneful rather than a beneficial effect on the moral character.

Since the moral effect of reward depends on its being recognized as the fruit of virtuous exertion, school rewards can only have such effect when they are conferred not on the ground of absolute attainment, which is largely determined by natural superiority, but on that of individual progress. To give a prize to a clever boy is not, strictly speaking, an act of moral discipline at all. On the other hand, to reward a boy for special exertion comes under that category, since it distinctly recognizes the moral element in intellectual industry.*

Development of Free-will.—As already pointed out, the aim of discipline is to build up independent virtuous habits. Hence punishments and rewards should always be used sparingly, and only as a temporary means of fixing good habits. As the child grows and is able to comprehend the intrinsic reasonableness of the commands laid down, he should be appealed to as a free agent able to choose the better. Only in this way can moral discipline be made a means of developing the power of deliberate reflection and choice, self-control, and moral character.

The parent and teacher must be on their guard against an overgovernment and overcontrol of the child's actions.

* On the considerations applicable to rewards, see Locke, *op. cit.*, §§ 52, 53; Bain, *op. cit.*, p. 112, and following.

The power of intelligent choice of what is good can only be exercised when a margin of free activity is secured to the child from the first. The child's own region of spontaneous activity or play must be respected. And as the intelligence expands he must be invited and encouraged to reflect for himself as to what is best for his happiness and usefulness. External control may easily be carried to excess, not only by an exaggerated view of the disciplinarian's function, but also by that eagerness to influence and sway another's actions which springs out of weak affection and a parental habit. The formation of character requires other influences besides that of the educator: the collisions of the individual with external circumstances and the lessons of experience. The teaching of Rousseau, Mr. Spencer, and others, as to the importance of making the young early acquainted, by personal contact and experience, with the laws of the physical and the social world, forms a valuable part of a sound theory of moral education. Even advice is erroneously proffered in cases where it is perfectly safe for a child to be allowed to discover the folly or wisdom of a course for himself. In the moral as in the intellectual region it is indisputable that the child's faculty is far more effectually exercised when he discovers a truth for himself than when he is merely taught it.[55]

Discipline of the Home and of the School.—The home may be called the nursery-garden of moral character. If the will and moral character are not nourished and strengthened here, they will fare but ill when transplanted to the bleaker surroundings of school-life. In the home the whole of the child's life is in a manner brought under the supervision of the educator. Not only so, the strong and close affection which grows up between the parent and child gives a unique character to the home discipline. On the one side, the mother is solicitous about her charge as the teacher can not be, and is far better able as well as much more strongly disposed to study his moral peculiarities. On the other side, the child's feeling of dependence and his gratitude and love are strong forces tending from the first in the direction of obedience. Here, then, the foundations of character have to be laid if they are to be laid at all. The relations of home, moreover, serve to bring out and exercise *all* the moral habits, not only the rougher virtues of obedience, veracity, the sense of right and justice, etc., but the more delicate virtues of sympathy, kindliness, and self-sacrifice.

Contrasted with this, the discipline of the school has but a very restricted moral effect. The immediate object of school discipline is indeed not moral training at all, but rather the carrying on of the special business of the school, namely, teaching. Incidentally the management of a school necessarily does subserve moral education, calling forth habits of obedience, orderliness, industry, deference, etc. And the teacher is expected to make the best of his opportunities for training the will and forming the character of his pupils. The limitations here are obvious. The first is the restricted range of life brought under the master's control. School occupations are a kind of artificial addition to the child's natural life, and offer but little scope for the play of individual feelings and motives. Again, since the teacher has to do with numbers, there must necessarily be wanting the aid of those moral forces of close individual sympathy and strong personal attachment which play so important a part in home discipline.

These defects are, however, made good to some extent by the presence of a new agency in the school, namely, that of public opinion. We have already glanced at the effect of this in shaping and giving strength to the growing moral sentiment of the individual. To this must now be added that the public opinion of a school, when rightly directed and serving to support morality, is a potent factor in early education. In early life the pressure of a mass of unanimous sentiment, and the influence of custom showing itself on a wide scale, are needed to supplement the work of parental and tutorial discipline. For the average child the reign of custom and law in a public school has a stimulating and invigorating effect. Respect for law, the sense of honor, and a manly self-reliance are nourished and strengthened. The influence only becomes injurious when it favors a perverted idea of duty and a false sentiment of honor; or when, ceasing to recognize its proper limits, and growing excessive and arbitrary, it tends to crush individuality.

APPENDIX.

On discipline and the formation of character, see Locke, "On Education," especially §§ 32–117; Miss Edgeworth, "Practical Education," chap. ix; Mme. Necker, "L'Education," livre i, chap. iv–vi; and livre vi, chap. iv; H. Spencer, "Education," chap. iii; Bain, "Education as Science," pp. 100–119; Beneke, "Erziehungs- und Unterrichtslehre," Kap. 2, "Gemüths- und Charakterbildung"; Waitz, "Allgemeine Paedagogik," §§ 11–15, pp. 140–213; Dittes, "Grundriss der Erziehungs- und Unterrichtslehre," 5. Abschnitt.

APPENDIX A.

PERIODS OF DEVELOPMENT.

In tracing out successively the several directions of mental development, we run the risk of overlooking the nature of the actual process, viz., the unfolding and expansion of the mind as a whole. Concrete mental development is at once an intellectual, an emotional, and a volitional progress, in which each factor acts upon and is acted upon by the others. Hence it is desirable to supplement the analytic and *abstract* treatment of mental development, which proceeds by dealing separately with intelligence, feeling, and will, by a *concrete* treatment which aims at marking the successive stages of the mental history.

The perfect carrying out of this supplementary method would yield a record of successive periods of mental growth, which are clearly marked off one from another by certain dominant characteristics, physical and psychical. A careful sketch of each of these periods, with all the characteristic changes which distinguish it from preceding stages, would supply a valuable addition to the theory of mental development. Such a concrete and descriptive treatment of the subject would, moveover, be of special value to the educator, who is called on to deal with minds at a particular stage in their history, and who consequently needs to know the special psychical features the relative strength of different capacities, impulses, etc., which distinguish the age.

It is not to be wondered at, therefore, that writers on education have adopted this mode of tracing the complex movements of mental growth. Thus Beneke, in the work referred to, distinguishes between four periods: (1) To about the end of the third year, in which the consciousness of self and not-self gradually unfolds, and which is characterized by the predominance of the outer sense-life, including instinct. (2) To about the end of the seventh year, in which the inner mental activity gradually develops itself to the point of equilibrium with the receptive functions of sense, and which is characterized by the rise of the representative element as seen both in the greater depth of the precepts and in the growing activity of memory and imagination, and also by the gradual displacement of instinctive impulse by conscious design. (3) To about the end of the fourteenth year, in which the inner self-activity becomes free from the bonds of sense and acquires a preponderance, first and chiefly as imaginative activity, then as a tendency to abstract reflection or thought. (4) To the close of school-life, in which the higher mental powers are more fully developed, and which forms a transition to the period of independent, intellectual, and moral activity.

A more careful and elaborate division of the mental life into periods is attempted by Pfisterer, in the work on pedagogic psychology, already referred to: (1) According to this plan the first period is marked off as the suckling age (to end of first year), in which the bodily life and sense are in the ascendant, and instinct takes the place of will. (2) Next comes the age of childhood, from the second to the seventh year, which is regarded as the beginning of the school period. Here there manifests itself a germ of self-consciousness, though the outer world is still engrossing. Curiosity shows itself in its lowest form as a desire for novelty. Memory and imagination are active, and the rudimentary stage of abstract thought or conception is reached. Activity is abundant under the form of free, aimless play. The disposition to respect authority and to form habits of obedience now shows itself, assuming, toward the close of the period, something of the aspect of a willing, reflective submission to moral rules. Feeling now loses something of its first violence, and is being organized into permanent dispositions (Stimmungen). (3) After this follows the period of boyhood and girlhood, from the seventh to about the fourteenth year. This constitutes the period of elementary school instruction. It is marked by a clearer exhibition of individual peculiarities. The intellectual processes gain in steadiness under the control of a stronger will-power. Hence there becomes possible the more orderly constructive activity involved in learning, as well as the methodical formation of abstract ideas. A growing habit of self-control now asserts itself. The progress of intellectual and volitional capacity leads to the development of independent judgment, free choice, and self-reliance. Finally, this period is characterized by the development of new feelings, viz., the social, intellectual, and æsthetic sentiments. (4) The period of youth, forming the interval between the school period and manhood, and supplying the transition to perfect independence and self-reliance in thought, feeling, and action, is only briefly glanced at.

It is to be added that these divisions of early mental development into periods, though useful as a rough index to the mental characteristics of a given age, are not to be regarded as having sharply defined boundaries. Mental development is throughout one smooth, continuous movement, not a succession of discrete movements or separate springs. An approximation to a definite boundary-mark is supplied at one or two points of the road. Of these the first is the well-marked termination of the helplessness of infancy by the development of the muscular system, bringing (at about the same date) the power of self-feeding, locomotion, and speech. This development of muscular power brings a vast extension of the field of observation and knowledge, as well as of that of voluntary action. Another date, hardly less epoch-making, is the attainment of puberty, a point of development in which certain physical changes, bringing with them new instincts, are apt to affect profoundly the intensity and the range of the emotional life as a whole, and along with this to exert a marked influence on the directions of intellectual activity and of conduct.*

* As pointed out by M. Compayré ("Histoire Crit. des Doctrines de l'Ed. en France," ii, p. 41), Rousseau, in treating the child up to twelve as non-rational, fell into the error of marking off too sharply successive periods of development. According to Sir J. Crichton Browne, the course of physical development can be divided into periods of seven years by help of the following epochal changes: 1, primary dentition (1st year); 2, secondary dentition (7th year); 3, puberty (14th year); and, 4, maturity (?addition of wisdom teeth) (21st year). See "Book of Health," p. 319, and following.

APPENDIX B.

MEASUREMENT OF FACULTY.

One of the most hopeful developments of modern psychology is the attempt to reach an exact quantitative estimation of mental processes. This introduction of a more exact mode of measurement of mental phenomena is likely to have important practical effects on the theory of education.

The teacher may undertake a systematic measurement of the faculties of his pupils for one of two reasons. (1) For one thing, a collection of comparative measurements is greatly needed as a statistical basis in building up a more exact psychology of childhood. Thus the theory of mental development, which aims at fixing with some approach to precision the date at which certain faculties begin to acquire strength, and the rapidity of the processes of development, would be rendered more definite and certain by a body of methodical records of mental progress carried out by teachers.

One branch of the science of education, very imperfectly developed at present, and likely to receive considerable aid from such a systematic collection of measurements, is the influence of sex on mind. Much that has been written on this subject, being the result of the observations of many generations, has a certain empirical value, such as the common attribution to girls of greater sensibility, a tendency to the concrete rather than the abstract, as well as a greater rapidity of mental development.* Nevertheless, these generalizations are wanting in scientific exactness and certainty, and, on the other hand, the deductions drawn from physiological facts stand in sore need of a careful verification. The pressing problem of modern education, how far it is well to subject the minds of boys and of girls to the same amount and kind of educational stimulus, requires for its solution the assistance not only of physiological truths, which are undoubtedly of great value here, but of psychological facts. A body of carefully prepared statistics on the comparative mental capabilities of children of both sexes, and their relative rapidity of development, is urgently needed just now.

(2) While a systematic measurement of children's faculties is thus of great consequence for perfecting the theoretic basis of education, it is of hardly less importance in carrying out efficiently the practical work of teaching. The success of school or class teaching depends, to a large extent, on a good arrangement of individuals according to their special powers and correlative tastes. Every such classification presupposes some more or less exact estimate of the individual child's capabilities by oral examination or otherwise. But ordinary educational tests of capacity are apt, from the nature of the case, to be rough and precarious. They are wanting in scientific aim and in scientific method. They aim at best at a rough valuation of so highly complex a product as "general intelligence," instead of at a precise measurement of the root-elements of mental capacity.

What is wanted for a fruitful carrying out of such measurements is psychological guidance as to the fundamental constituents of mental power, and the way in which these vary. Such variations, being known to be

* Pfisterer sums up the commonly recognized points of sexual difference. "Paed. Psychologie," Kap. 3, § 23.

correlated with nervous differences, should be expressed in terms of mental and nervous capacity. The old doctrine of individual temperaments, and the newer theory of phrenology, each of which sought to supply a scientific principle of classification, have now become discredited. And more recent attempts to find a substitute for these can hardly be said to be satisfactory. Thus the mode of distinguishing individual aptitude common among German writers on pedagogy, viz , according to the degree of sensibility to stimulus, vivacity or rapidity of the mental processes, and strength and tenacity of impression, though suggestive and valuable, is obviously imperfect.* Without attempting here to propose a fully-developed scheme of mental measurement, I would point out the lines which such a scheme should follow.

A truly scientific and systematic measurement of mental power should set out with a detailed examination of the senses. And here modern science comes to the teacher's aid both in ascertaining the several modes of variation of sense-capacity, and in selecting the best way of measuring these. The important conception of a threshold or lower limit of capacity serves at once to give precision to the investigation. Thus the most valuable intellectual element in sense-capacity, viz., discriminative power, can be exactly tested by determining the smallest difference of degree or quality that can be detected by the child. Although the perfect carrying out of a systematic examination of discriminative capacity in the case of all the senses necessitates carefully prepared apparatus, a good deal may be done by means of quite simple preparations. Thus the limits of color-discrimination may be determined by ascertaining the finest perceptible differences of shade of a graduated series of blues, greens, etc.†

* This threefold distinction is given by Beneke and adopted by Dittes.

† Mr. Galton's way of testing color, explained in his "Life-History

In a similar way the discrimination of form-elements might be tested by noting what is the smallest deviation from perfect straightness in a line that is defective.

The investigation of sense-capacity should be complete, embracing the muscular sense as entering into the appreciation of weight, etc. And along with discriminative sensibility should be measured absolute sensibility. Here again the idea of a threshold is available. Thus Mr. Galton proposes, for testing the absolute sensibility of the ear to sound, the simple expedient of estimating the greatest distance at which the ticking of a watch can be heard. And, lastly, as bearing on the emotional or pleasure-and-pain side of the senses, the child's sense-organs should be tested as to the strength of stimulus, e. g., light or sound, which begins to be disagreeable and fatiguing.

Next to a systematic testing of sensibility and, along with this, of muscular capacity, the educator should go on to estimate differences in the power of attention. Thus precision and rapidity of adjustment in attention, an all-important quality in the capacity of learning readily, might be tested by aid of giving some momentary signal, the nature and exact time of which are not known beforehand, e. g., an indeterminate letter of the alphabet articulated faintly or exhibited to the eye for a second, and noting the relative degrees of certainty in seeing the signal. Along with this, another no less valuable quality of attention, range or grasp, may easily be tested, e. g., by determining the greatest number of consecutive sounds, as letters or digits, that can be held together by the mind, so as to be repeated or written down on a single hearing, or the largest number of letters that can be seen by a momentary exhibition to the eye of a miscellaneous group of such.

Album" (Macmillan & Co.), by asking a person to pick out all the greens among a series of delicately tinted wools, involves not only discrimination but assimilation.

The grasp of attention has recently been tested by Mr. Jacobs and Mrs. Bryant in the case of a number of boys and girls. The method employed was to give out a series of nonsense syllables, or of names of digits, and ask the pupil to repeat the same or write it down. The largest number that could thus be reproduced after a single hearing is said to determine the "Span of Prehension." The results so far gained suggest that this power varies pretty uniformly with the degree of general intelligence, being considerably greater in the case of normal children than in that of imbeciles, and rising with the position in school. It is not improbable, therefore, that this test may prove to be a particularly serviceable one to the teacher.*

Closely connected with this power of grasping a number of impressions is the aptitude known as quickness or keenness of observation. In an interesting paper on the "Condition of Pupil," read some years ago before the Education Society, Mr. Lake proposed that this faculty might be tested by bringing children for a moment or two into an unfamiliar room, bidding them note as much as they can, and immediately afterward setting them to write down all they have observed.†

It is hardly necessary to say that the quality of retentiveness is one which specially needs to be measured by the teacher, and this, like discrimination, in all its special manifestations. And here again an approach to scientific precision is possible by making use of a limit. Thus children might be tested as to the number of repetitions of lines necessary to retaining them both for a shorter and for a longer period.‡ In a series of examinations of this

* For an account of these experiments, see "Mind," January, 1887 ("Experiments on Prehension").

† Such an exercise, as has been pointed out by Mrs. Bryant, may be used to test not only rapidity and grasp of mind, but readiness in the imaginative interpretation of impressions which form so important a constituent in the faculty of observation, and also the strength and influence of the feelings in disposing the mind to a vague, emotional way of regarding things.

‡ Mr. Lake proposed that series of names and connected words be read out three times by the master, and others read by the pupil three times, and then written down, and the number of errors counted.

kind it might be ascertained in what special directions a child's mind was retentive, and what modes of association (e. g., order in time and order in space) were most easily acquired.

In connection with retentiveness, imaginative power, as shown in the distinctness and fullness of images of familiar objects and scenes, should be tested. Mr. Galton's inquiries into the powers of individuals of "visualizing" objects might easily be made the starting-point in such an investigation of children's faculty.*

Lastly, reference may be made to that intellectual function which forms the essential element in the generalizing faculty, viz., the detection of similarity amid diversity. This is best tested by getting a child to compare a number of objects simultaneously presented to the eye. Thus Mr. Lake has suggested that groups of letters agreeing in certain respects, e. g., thickness of line, degree of blackness, should be submitted to the pupil with a view to his discovering in what respects they agree. Here, it is evident, the sense of difference as well as that of likeness will be appealed to, and it is very important to note the pupil's *relative* quickness in noting the one and the other.†

This much may suffice to show that a sound scientific method of testing the strength of children's intellectual faculties has now become possible. It is greatly to be wished that by the co-operation of teachers and psychologists a definite scheme of measuring faculty may soon be developed.

* Mr. Galton's method is explained in his work, "Inquiries into Human Faculty," p. 83, and following.

† I have attempted to frame a definite line of investigation into the strength of the comparing faculty in an article on "Comparison." "Mind," October, 1885.

APPENDIX C.

METHOD IN TEACHING.

THE term method is somewhat ambiguous and requires precise definition. In its widest sense it means the conscious direction of a series of active operations toward some desired result *according to a preconceived plan and by the aid of general rules or principles.* A methodical process thus contrasts (*a*) with a mechanical (unconscious), as also with a hap-hazard (undesigned) operation, and (*b*) with an empirical or traditional mode of securing some practical end, which has not been reflected upon and grounded on general principles. It is essential to the idea of a method that it have universal validity; that is to say, that it be applicable in all similar circumstances.

In a special logical sense method denotes an orderly arrangement of our ideas so as to exhibit their logical connections, whether for our own clearer understanding or for the better instruction of others.

The use of the term method in education is based partly on the wider, partly on the narrower, meaning. Thus in a large sense method in education means the disposing and arranging of different parts of our work so as to best secure the true end of education. In this comprehensive sense method presupposes a clear apprehension of the educational end, and of the relations of the several agencies employed to this end, both separately and collectively, i. e., as parts of an organic plan or system of agencies.

As thus defined, method in education is determined by two main factors: (*a*) the nature of the end, (*b*) the nature of our appliances.

It is obvious, in the first place, that since a method aims at the attainment of an end, it will be affected by our conception of this end. Thus an "Informationist," as distinguished from an "Educationist," who regarded it as the sole business of the teacher to impart a certain quantity of useful knowledge to his pupils, would necessarily be led to elaborate a plan or method of instruction on these lines.

In the second place, our method will be determined, not only by our conception of what we *want* to do, but by that of what we *can* do, and more particularly of the nature and properties of the instruments at our disposal. Here the constitution of the child comes in for the first consideration. Our principles of method have to conform themselves to the laws of the child's being, physical, intellectual, and moral. In addition to the nature and constitution of the learner, we have to take into account the properties of the agents we employ, as subjects of instruction, and accommodate our methods to these.

While the term method may thus be employed with respect to the whole work of education, it is commonly confined to the processes of intellectual instruction. The reason seems to be that these lend themselves much more easily than the other branches of education to formal regulation. And this circumstance, in its turn, is explained by saying that each of the determining factors is in this part of education well defined and manifest. For, in the first place, the intellectual activities engaged in learning are of all the mental activities the most easily reduced to a general form, and subsumed under general laws. Secondly—and this is of equal if not of greater importance—the subject-matter of intellectual instruction, systematized knowledge, science, has its inherent and unalterable logical relations which dictate a particular order of proceeding in presenting the subject to the learner (the elementary and fundamental before the advanced and derivative). Lastly, teaching, by employing as its proper instrument an organized elaborated language, has its method of procedure to some extent definitely determined by this circumstance.

A word or two may be added on each of these, which we may distinguish as the psychological, the logical, and the linguistic factor in the method of teaching.

(*a*) The whole process of instruction is primarily determined by the condition and powers of the child's mind, and the essential forms of its activity. And it is these psychological considerations which underlie the best current maxims of method. (1) Thus it is the first condition of sound teaching that it awakens the self-activity of the learner's mind by exciting interest and curiosity, leading it to think for itself (by questioning, and so forth). (2) Again, since the child starts with sense-presentations, the direction of instruction must in general be from the concrete to the abstract. (3) Once more it may be said that the intellectual process of acquiring knowledge consists in general in taking a whole (e. g., a sensible object) vaguely apprehended, then by analysis resolving this into its parts, and from a clear detailed knowledge of these parts building up by synthesis a definite and complete cognition. Accordingly, the method of instruction should in general be preparatory analysis followed by synthesis or orderly construction of a whole out of its parts. (4) All advance in knowledge takes place by an elaboration of pre-existing intellectual material; otherwise expressed, every new acquisition is an organic process of growth, new structural parts being formed or accreting about the pre-existent as a nucleus by what is known as intellectual assimilation (or apperception). Hence the universality of the rule "From the known to the unknown" (e. g., from the seen to the imagined, a familiar case to an analogous one, concrete observations to general notions and judgments).

Two additional rules of method follow also from a consideration of mental processes. (5) Since faculty grows in amplitude of movement, the order of presentation must be from simple to complex facts, ideas, and truths. (6) Since all clear knowledge is the result of a prolonged process involving critical reflection, we should at first be satisfied with vague cognitions, and try to make these more definite as we advance.

These rules, it may be added, apply both to the learning of a particular subject considered separately, and to the acquisition of the whole sum of knowledge, or the curriculum of subjects.

(*b*) Logical considerations, as distinct from psychological, have to do with the relations of the different parts of a subject (and of the several subjects of the curriculum). Here the point of view is different. We no longer consider the child as it is, what it knows at the outset, and how its mind can move forward from that starting-point; but we suppose the whole body of knowledge to be attained, and then ask ourselves what is the best order in which to arrange its several parts so as to exhibit it as a connected organized system. As pointed out before, such logical arrangement may aim at a clearer and firmer grasp of the whole by ourselves, as in the case of the famous rules of method drawn up by Descartes,* or at the better instruction of others. In the latter case, it helps to fix the method of teaching. The teacher is here supposed to be complete master of the subject, and to be able to develop it in a correct logical manner.

Such a logical arrangement of the matter of instruc-

* See Jevons's "Elementary Lessons in Logic," xiii.

tion must of course conform to psychological requirements to this extent, that it enables the mind of the learner to advance step by step from one cognition or group of cognitions to another.

At the same time the two requirements, the logical and the psychological, are not identical. It has commonly been held that the ideal logical arrangement is the setting out with elements (simple ideas, self-evident truths), and the systematic development of the whole complex body of knowledge out of this by synthetic construction. This mode of procedure conforms to psychological conditions in a sense, since it means an advance from simple to complex cognitions. On the other hand, it evidently tells us to set out, not with the concrete, but with the abstract; for all the elementary notions of science—e. g., animal, force, verb—are the result of long and often difficult processes of abstraction.*

The logical arrangement must no doubt be set up by the teacher as the ideal toward which he works in proportion as the child's intellectual powers develop. But it can not be attempted at the outset. The elements required as the foundation of a subject are not known to the child, but must be reached by a preliminary process of analysis carried out on those sense-intuitions which are the first form of cognition reached by the child. In other words observation, comparison, classification, induction, must precede the definition of the class or notion, and the statement of the law or principle. Not only so, in the earlier stages of instruction, the educator must not aim at once at scientific accuracy, but be satisfied to approach this gradually through stages of imperfect and crude conception. To this extent, then, the so-called method of instruction must be modified by being brought

* The student should note that, as applied to knowledge, the simple coincides with the abstract, the complex with the concrete. We simplify our knowledge by generalizing, and so reducing it to unity.

nearer the method of discovery; yet so as never to become altogether the method of discovery since it is controlled by a logical ideal.*

(*c*.) The third factor, the nature and requirements of language, is important mainly in that it compels us throughout the teaching process to introduce an abstract element. As shown above, even in dealing with concrete facts presented to the child's imagination, we have to describe by means of a system of general symbols. To this extent, then, the psychological requirement, the concrete our starting-point, has to be still further modified in educational practice. At the same time the psychological rule is not set aside, for, as we have seen, the child imagines a new object by help of sensible objects actually observed.†

It seems to follow that our method of teaching must be a compromise; our goal is precise scientific definition, logical arrangement, systematic exposition; and as regards sequence of subjects, gradual progress from the more simple and fundamental to the complex and derivative. Yet just because we have to do with unformed minds we can not in practice realize this ideal, though we should certainly approach to it as we advance.

It is evident from what has been said that the current maxims of educational method can not be pressed as hard and fast rules, knowing no exception or qualification. In some cases, indeed, they are manifestly contradictory in a measure (e. g., from the simple to the complex, and from the concrete to the abstract). And when this is not the case, a rule may have to be qualified by consideration of

* The contrast in point of view here touched on was indicated by the older logicians under the distinction "better known in nature" (*notiora naturæ*), and "better known to us" (*nobis notiora*). See Jevons's "Elementary Lessons in Logic," p. 204.

† The conditions imposed by language are touched on by W. H. Payne, "Contributions to the Science of Education," p. 77.

the special conditions of teaching. Thus, though it is a general rule of great value that we should proceed from the known to the unknown, this does not mean that the teacher, with his superior knowledge and able to command the resources of language, should never begin by introducing the unknown.

The combination of psychological and logical principles leads to another maxim of teaching, from the empirical to the rational. In the early stages the child's mind should be occupied mainly about facts, and the more obvious empirical generalizations reached by comparing these. Then should come the scientific or rational stage in which the empirical generalization is explained. Thus a child should first note the fact that numbers ending in 5 are divisible by 5, that the great seats of commerce are situated on rivers, before he is taken on to account for these, or deduce them from more general principles.* In this way the learner's mind not only moves from concrete to abstract, but back again from abstract to concrete, bringing back with it ever clearer and fuller knowledge.

It may be observed that there is a tendency in educational writings to multiply distinctions of method. Thus we read not only of the broad distinctions, as analysis and synthesis, but of a dogmatic, a heuristic, a questioning, and even a lecturing method.† Here it is obvious the term no longer refers to the most general forms of the learning, and consequently of the teaching process, but to particular modes of procedure or devices. The general principles of method are fixed and admit of no variation; the particular practical devices by which it is sought to carry these out are variable.

* This combination of induction and deduction, so valuable in teaching, is known to logicians as the "deductive" or the "complete" method. See "Jevons's Elementary Lessons in Logic," xxx.

† See Tait, "Philosophy of Education," p. 23; Compayré, "Cours de Pédagogie," part ii, leçon i.

Much the same relation obtains between the rules of method as here understood and the methods peculiar to the different subjects of instruction. The best way to teach the alphabet, geography, and so on, is determined in part by general principles of method. But it is also determined in part by the pecularities of the subject, and the particular appliances obtainable. Here, then, also we have to distinguish the fixed fundamentle principle from its particular and variable application.*

* On method in teaching, see H. Spencer, "Education," chap. ii; Bain, "Education as Science," chap. vi and vii; Payne, "Contributions to the Science of Education," chap. v; Compayré, "Cours de Pédagogie," part ii, leçon i; T. Ziller, "Vorlesungen über Allgem. Pæd.," p. 212, etc.; and Article, "Methode," in Schmid's "Pæd. Handbuch."

NOTES.

a P. 12. On the scope and aim of education and its special relation to psychology, the student may consult: Prof. W. H. Payne's "Contributions to the Science of Education," chap. ii; G. Compayré's "Cours de Pédagogie," leçon i; Mrs. Bryant's "Educational Ends," Introduction; Beneke's "Erziehungs und Unterrichtslehre," §§ 4 and 5; and the article "Seelenlehre" in Schmid's "Pädagogisches Handbuch."

1 P. 26. The subordination of all intellectual processes to action or conduct is recognized by ancient and modern authorities. Aristotle says the end of our study is not knowledge but conduct, or, as Auguste Comte puts it, "Savoir pour prévoir afin de pouvoir." (See Lloyd Morgan, "Springs of Conduct," p. 214.)

2 P. 54. Compare what was said above, chap. iii, especially p. 36 and following. According to Sir J. Crichton Browne, brain-growth shows itself in (1) increase of size; (2) change of quality (change of chemical substance); (3) elaboration of structure, which grows more complex through formation of nervous connections; (4) differentiation of distinct organs, and the co-ordination of these in a balanced system; and (5) in the establishment of functional habits. (See "Book of Health," p. 283, etc.)

3 P. 62. The force of the innate element in the case of strong minds is illustrated in the fact of the striking difference between John Stuart Mill and his father, in spite of the latter's unusually close and severe control of his boy's education. (See J. S. Mill's "Autobiography.") On the other hand, the power of education, when the educator concentrates himself on an individual pupil, is strikingly illustrated in the history of the celebrated child, Laura Bridgman, and of another blind-deaf-mute, Helen Keller. (See "Mind," iv, p. 149; xiii, p. 314; and xiv, p. 305.)

4 P. 63. While regarded in one way, the teacher's office thus appears a mere extension of the system of natural influences under which a child develops, viewed in another light it is non-natural, and even anti-natural. As *art*, education aims at interfering with, modifying and controlling the processes of Nature. (See the remarkable essay on Nature in J. S. Mill's "Essays on Religion.") The overlooking of this opposition of art to Nature led Rousseau to the extravagant idea that the child should during the first twelve years remain without book-instruction, being handed over to Nature's teaching (l'éducation des choses). The same oversight explains a good deal of the more recent vague talk in educational literature about "following Nature," and so forth. (See W. H. Payne's "Contributions to the Science of Education," chap. vii; and Compayré, "Cours de Pédagogie," p. 21 and following.)

5 P. 65. Training has to do with the production of some definite result, such as bodily agility. We speak of the child being trained to think, to deliberate, and so forth. The development of all the powers in harmonious combination is best expressed by the word education or culture. (See article "Culture," "Cyclopædia of Education.")

6 P. 65. Rousseau urges as one main reason for postponing formal instruction that it enables us the better to study the genius of the child. Individual characteristics of children come out very clearly in their play. Hence one reason why the teacher should take note of this. (On the importance of developing the individuality of the child, see Jean Paul Richter, "Levana," fragment ii, sec. ii; Beneke, *op. cit.*, § 9; and article "Individualität," in Schmid's "Paed. Handbuch.")

It may be added that individuality becomes more marked, both in respect of *physique* and *morale*, as life advances. This is in accordance with the conception of the process of development as a constant advance in specialization and definiteness of character. In the history of the child the animal becomes specialized by the emergence of distinctively human traits, and the common human type becomes more and more differentiated into a definitely characterized individual. Hence the need of specializing more and more in education as the pupil advances in years.

6*a* P. 65. In distinguishing different stages of intellectual development, as perception, imagination, and thought, we do not mean that the child first passes through and completes a stage of observation, then enters upon a stage of pure imagination, and so on. Strictly speaking, this sequence necessarily holds good only of single intellectual products —e. g., the idea of weight or figure. And though we may say that sense-perception predominates in childhood, imagination in early youth, and abstract thought (in the case of the highly educated) in manhood, we must not forget that the exercise and improvement of sense observation continue as long as mental development progresses. In truth, the exercise of the higher functions of thought reacts on, and helps to perfect, our sense-perceptions, facilitating the analysis and classification of the individual objects that we observe. (See Appendix A, "Periods of Development.")

7 P. 69. The mental attitude of attention is accompanied by cessation of bodily movement. When during a walk we try to think closely, we involuntarily stand still. The physiological concomitants of attention are fully discussed by Ribot's "Psychologie de l'Attention," chaps. i and ii.

8 P. 74. This effect of familiarity on the attention would be explained by the Herbartian psychologists by help of their doctrine of Apperception. According to this, we only become interested in new impressions, and so attend to them so far as they are "apperceived"—i. e., attached by bonds of affinity to groups or masses of ideas pre-existing in the learner's mind, the result of previous processes of acquisition. (See below, note 15.)

9 P. 86 This truth was formulated in the maxim of the schoolmen—"Nihil est in intellectu quod non prius in sensibus erat." Rousseau expressed the relation in his own fashion by saying, "Nos premières maîtres de philosophie sont nos pieds, nos mains, nos yeux." ("Émile," Ed. Garnier, p. 118.)

10 P. 103. The educational importance of such fine discrimination is insisted on by Prof. Bain ("Education as Science," p. 15). On the other hand, Prof. W. H. Payne reminds us that subtle sense-discrimination distinguishes the savage, and is, therefore, no guarantee of higher intellectual development ("Contributions to the Science of Education," pp. 27, 82).

11 P. 106. Rousseau was so impressed by the importance of the sense of touch that he recommended certain games to be played in the dark in order to develop the tactile perceptions, as in the case of the blind, and so to give children confidence in the dark ("Émile," p. 128, etc.).

11*a* P. 107. The development of the senses has been carefully traced by Prof. Preyer, "Die Seele des Kindes," 1. Theil. The importance of exercising sense-discrimination is discussed by Dr. Bain, "Education as a Science," chap. iii. The relation of the educator to the senses in respect both of the health of the organs and of their use as mental instruments is discussed by Compayré, "Cours de Pédagogie," leçon iv. The moral education of the senses is dealt with by M. Perez, "L'Education dès le Berceau," chap. ii.

12 P. 125. Rousseau well illustrates the aid that an educator can render the child by clearing up the natural illusions respecting distance, and by pointing out the real relations of objects ("Émile," p. 137).

13 P. 135. The earliest impressions remembered in after-years appear to be those caused by something appealing strongly to childish wonder and awe. George Sand, whose memory of earlier days was singularly far-reaching, could recall a blow she received when an infant and carried in her nurse's arms, which she says first woke her to a sense of life. Steele's recital, in the "Tatler," of his first sense of sorrow, caused by the death of his father, when he was five years old, illustrates the effect of awe and terror in fixing impressions. (Quoted by Thackeray, "English Humorists," Steele.)

14 P. 142. To these conditions of suggestion we ought perhaps to add another, viz., the intensity or vividness of the reviving element. It has been pointed out by Hume and others that a sense-impression will call up any associated circumstance more powerfully than its corresponding idea. The actual sight of a place suggests an experience localized there far more vividly than does the mental image of that place. Colonel Parker ("Talks on Teaching," iii) makes use of this fact in urging on the teacher the importance of associating names directly with the real objects presented to the senses.

15 P. 145. Association by similarity illustrates the general principle of all intellectual acquisition, that the mind only gains full possession of a new idea, fact, or truth when it assimilates it to kindred elements of cognition already acquired. This attaching or linking on of new ideas to old is described by the Herbartian psychologists as *Apperception*. We apperceive or mentally appropriate a new idea through the medium of some similar idea or group of ideas. (Cf. note 8. For a short account of Herbart's doctrine of apperception, see "Mind," xiii, p. 484, etc.; and on its pedagogical application consult J. A. M'Lellan, "Applied Psychology" (Toronto, 1889), and Dr. K. Lange, "Ueber Apperzeption.")

While similarity is thus of first-rate importance as an aid to memory, it is not without its drawbacks. Since it tends to bring and to keep together in the mind distinct experiences and impressions, it may easily lead to confusion of particular facts. Thus a mind that is much under the influence of similarity is apt to mix up different words, sayings, historical characters, and so forth. An accurate memory for concrete details and particular facts implies a balancing of the assimilative by the discriminative impulse. As Jean Paul Richter puts it, similarities, the rudder of Recollection, are the cliffs of Memory ("Levana," § 141).

16 P. 164. Comenius used to say, "Repetitio memoriæ pater et mater est." On the other hand, the teacher must be on his guard against dry mechanical iteration. Here, as elsewhere, we may take a hint from the child's spontaneous tendencies. He likes the same story to be repeated after an interval, but would resent too frequent repetition. The monotony of repetition must be counteracted by variety in mode of presentment, illustration, etc. It has been pointed out that the things best remembered by children are the words of their mother-tongue, which are often repeated, but in ever-fresh circumstances (Schmid's "Paed. Handbuch," article "Gedächtniss"). Finally, it may be added that the best things, whether stories, jokes, as the venerable one allowed by Diggory in "She Stoops to Conquer," or wise and beautiful sayings, bear the most repetition.

17 P. 166. George Sand, in her delightful account of her childhood, tells us that she got so tired of repeating La Fontaine's fables that she tried not to understand them.

18 P. 169. These devices commonly involve an impulse to give an appearance of order or class-arrangement to disconnected details, and so bring in the action of similarity. Thus the height of Snowdon (3,571 feet) is easily remembered as a series of odd digits. Similarly, in the case of the celebrated dates in English history, the '88's. Sometimes we remember a thing better by investing it with an adventitious dignity, as in remembering the number of a house, 32, by thinking of it as 2^5. In like manner, the noticing of anything in a name which lends it a comical aspect may help us to retain it by arousing a measure of feeling in connection with it.

19 P. 170. This branch of memory-training connects itself with the practical problem, the proper use of questioning in education, so far, that is to say, as questioning aims at calling forth what is known or supposed to be known, whether as a preliminary to teaching or as the supplementary test of it. (On this subject see Fitch, "Lectures," pp. 158, 159; and article "Question and Answer," in the "Cyclopædia of Education.")

20 P. 181. It has been pointed out by Motet and others that children of abnormally strong imagination are apt to fall into illusions of memory; confusing what they have imagined, read, or had suggested by others with what has actually happened ("Les faux témoignages des enfants devant la justice," 1887).

21 P. 183. "Making believe is the gist of his (the child's) whole life, and he can not as much as take a walk except in character. I could not learn my alphabet without some *mise-en-scène*, and had to act a business man in an office before I could sit down to my book" (R. L. Stevenson, "Virginibus Puerisque" ("Child's Play"), p. 235, etc.).

"The whole existence of these little children is dramatic. Their life is a dream, smiling, prolonged, entertained designedly" (Madame Necker, *op. cit.*, i, p. 303, etc.).

The odd mingling of this make-believe impulse and the rational or critical impulse is seen in the alternating credulity and skepticism of children with respect to their dolls and toy-animals. This condition of mind has been admirably described by George Sand when recalling her own feeling toward her dolls ("Histoire de ma Vie," iii, p. 181).

22 P. 185. Mr. Herbert Spencer has shown, in a very interesting way, that the same holds true of the development of the race. The progress of a people in civilization and culture is accompanied by a wide expansion of the imagination. (See "Principles of Psychology," ii, §§ 491, 492.)

23 P. 189. Plato's severe proposal, in the "Republic," to banish the poets and deprive them of their great educational function, was based on ethical grounds—the harm done to the minds of the young by representations of the gods as vicious. At the same time it indicates a low estimation of the intellectual function of the imagination as representative of sensible objects, and as opposed to divine reason, which intuits universal ideas. Rousseau was particularly hard on feeding children's fancy with fictitious story. George Sand opposes Rousseau's idea, and claims full liberty of action for the imagination ("Histoire de ma Vie," ii, p. 156).

24 P. 190. "To exercise the imagination innocently is just as necessary as to restrain it, and perhaps we only restrain it when we exercise it" (Madame Necker, *loc. cit.*, p. 322).

25 P. 212. It is not improbable that children, when forming the idea of self, often go through stages of fanciful construction resembling what is known of the first ideas about self entertained by primitive man. Sometimes the idea of a number of selves precedes that of a single united self, as in the case of Hartley Coleridge, who, when told something about himself, asked, "Which Hartley is it? There is the

real Hartley, and the picture Hartley, and the shadow Hartley, and the catch-me-first Hartley," this last remark being accompanied by the act of catching hold of one arm by the other. George Sand tells us that her first acquaintance with the echo (in her fourth year) led her to think of herself as having a double existence, and that this, added to the experience of subjective sensations of sight, after looking at a bright dome and then closing the eyes (ocular spectra), suggested a theory closely similar to the animistic idea of uncivilized man, viz., that everything has its double. (On this primitive animism, see Tylor, "Primitive Culture," chap. xi. On the development of self-consciousness in the child, see Preyer, "Die Seele des Kindes," chap. xx.)

26 P. 215. The two intellectual functions, assimilation and discrimination, though always found together in our processes of thought, are in a measure opposed, sometimes the one, sometimes the other, being in the ascendant. This opposition is illustrated in the two contrary movements of thought illustrated in the text, viz., generalizing on the ground of likeness where difference is overlooked for the moment, and dividing a class where we turn away from the common likeness and fix our attention on differences. These two movements of mind answer to two distinct impulses or tendencies. (See Locke, "Conduct of the Understanding," xxxi.)

27 P. 227. It is worth noting that the child is apt to use nouns as qualifying epithets at first. Thus he will call a little dog "baby" dog. This suggests that abstraction can not as yet separate out for distinct consideration the particular quality, so that the child has to indicate it by reference to some like object, or like relation of objects.

28 P. 236. Parents and others are, one fears, apt to be very careless in explaining new words to children, contenting themselves to give a very rough definition, and even to name another term which is by no means an exact equivalent. Thus, a child, impressed by the catching word "jiffey," and asking what it meant, was told, "quickly, in a hurry" (!). He immediately began to apply (or misapply) the new vocable, by pointing to a steamer moving very rapidly and observing, "Dat puff-puff goin' in a jiffey."

29 P. 255. A generalization may be grossly careless when based only on one or two observed cases, or inexact because, though true of the majority of cases, is not uniformly so. Children are so eager to reach general conclusions that it is difficult to get them to note exceptions. Charles Darwin illustrates the cautious scientific spirit in that he paid special attention to (apparent) exceptions.

30 P. 273. Different opinions have been held by educators as to the desirability of reasoning with children. Locke was for treating them as rational beings, only taking care to give them such reasons as their age and understanding are capable of ("Thoughts on Education," § 81). Rousseau, who held that reason is only developed late, directly controverts Locke. He says, to pretend to educate a child by reasoning is to commence at the end, to wish to make of what is a product an instrument.

31 P. 285. Jean Paul Richter distinguishes cheerfulness from enjoyment. Animals can enjoy, but man alone can be cheerful ("Levana," frag. iii, ii). The need of making learning pleasant is insisted on by Locke: "Care should be taken that what is of Advantage to them (children) they should always do with Delight, and before they are weary'd with one thing should be timely diverted to some other useful employment" ("Thoughts," § 108). He even goes as far as to say that study can be made as enjoyable as play if it is divested of all appearance of constraint, and rewarded by praise (§ 129. Cf. § 76). This idea, however, has been regarded not only as impracticable, but as undesirable. (See Quick, "Educational Reformers," p. 193. On the conditions of cheerfulness see "Cyclopædia of Education" (Sonnenschein), article "Cheerfulness.")

32 P. 289. Among the early sense enjoyments, those of touch ought not to be overlooked. Children derive great and prolonged enjoyment from touching soft, warm surfaces and yielding substances, as fur, hair, etc. Miss H. Martineau tells us of the keen delight she felt, when about two or three years old, in passing her fingers round a flat button, covered with black velvet, on the top of a sister's bonnet ("Household Education," chap. xix). This delight in touching things greatly furthers the development of those tactual perceptions which, as we have seen, are the foundation of our knowledge of material objects.

33 P. 292. George Sand tells us that when she learned the alphabet she would repeat all the letters except B. Asked why she would not name that letter, she answered, with delightful childish inconsequence, "Because I don't know the B." What odd movement of infantile fancy, one wonders, underlay this prejudice against the unoffending letter.

34 P. 304. One of the most striking illustrations of this effect of which I know is one of George Sand's reminiscences of her childhood. She was lagging one evening behind her mother, who threatened to leave her if she did not hurry on. An old woman lamplighter, who happened at the moment to be lighting a lamp hard by, overhearing

this, threatened playfully to shut her in the lamp for the night. "I do not" (she writes) "remember that I ever experienced such a terror as she caused me. The lamp, with its glittering reflector, instantly assumed to my eyes fantastic proportions, and I already saw myself shut in this crystal prison, consumed by the flame which the punch in petticoats made to burst out at her pleasure." Mr. Anstey well describes the effect of the terrifying image of the policeman on a little girl's mind in his story, "The Giant's Robe."

35 P. 306. The question, What is the best way to deal with children's fear? has been discussed by Locke ("Thoughts," § 115 and following, and § 138) and by Rousseau ("Émile," book ii). Both lay stress on the importance of getting children to approach and examine strange objects which frighten them. George Sand, however, reminds us that to force a timid child to approach the object of its fear may make matters worse, and that it is often better to remove him from the cause and to distract his thoughts ("Histoire de ma Vie," ii, p. 164). Similarly, Madame Necker, *à propos* of the games in the dark recommended by Rousseau as a cure for fear of darkness, writes, "Those games in which the child forgets his fear effect more than those in which he braves it" ("L'Éducation Progressif," iii, chap. v).

36 P. 311. The characteristics of childish anger are dealt with by Percy ("L'Education des Berceau," chap. vi, sec. iii). The proper way to deal with passionateness in children is handled by Locke ("Thoughts," § 111 and following), Maria Edgeworth (*loc. cit.*), and by the writer of the article "Leidenschaftlichkeit und Selbstbeherrschung," in Schmid's "Paed. Handbuch." The fuller treatment of the mastery of passion will be found below, under the head "Self-Control."

37 P. 314. Compare the passages in Locke (§§ 129, 76) already referred to in note 31.

38 P. 317. The stimulus of emulation was relied on to a dangerous extent by the Jesuit system of education. (See Quick, "Educational Reformers," chap. i). Cowper satirizes the effect of public-school competition on the feelings and character in his poem "Tirocinium." To him emulation meant a compound "of envy, hatred, jealousy, and pride." Its proper place in education is judiciously discussed in Compayré's "Cours de Péd.," pt. ii, chap. xi; and in the important article "Wetteifer," in Schmid's "Paed. Handbuch."

39 P. 320. The desire for others' good opinion and reputation may be appealed to in lieu of the impulse of rivalry, as, indeed, it was done by Locke in his scheme of private education. Locke, however, pretty

certainly, in his turn, overrated the moral value of this motive. (See Mr. Quick's remarks on this point in his edition of Locke's "Thoughts," note, p. 218.)

40 P. 332. It is worth observing that the feelings here distinguished do not always exist in equal strength. One person sets more store by the actual possession of knowledge; another would rather side with Lessing, and prefer the exertion of pursuit, even without attainment, than the possession without the pursuit, if such thing were possible. Children, before they come to set its right value on knowledge, should be led, as far as possible, to learn for the pleasure of learning—that is to say, for the sake of the delight which intellectual activity immediately brings.

41 P. 332. Prof. Preyer observed the first distinct manifestation of wonder in his child about the fifth month (*op. cit.*, p. 108, etc.). The student should note the points of similarity and contrast between childish wonder and curiosity and that of animals, as described by Darwin and others. (See the "Descent of Man," part i, chap. iii.)

42 P. 341. George Sand tells us that, during her first long journey into Spain, in her fourth year, her mother used to say, "Look! how pretty that is," and adds, "Immediately those objects, which I should not have remarked myself, revealed to me their beauty."

43 P. 342. Care should, however, be taken not to force, or even encourage, original production before the taste has been sufficiently developed by the study of good models. On this point see Jean Paul Richter, "Levana," frag. viii, chap. i. "Nothing" he there says, "is more dangerous for art, as well as for character, than to express immature feeling."

44 P. 343. George Sand tells us she suffered keenly as a child from having her first *naïve* idea of prettiness rudely handled by others, more especially her somewhat pedantic grandmother, who was fond of correcting the child's taste by telling her that this face was not accurately drawn, this dress not harmonious in color, and so forth ("Histoire de ma Vie," ii, p. 161). (Compare what is said by Jean Paul Richter, Miss Wood's selections from "Levana," p. 104.)

45 P. 344. The cultivation of the æsthetic sentiment connects itself with moral education at another point, viz., admiration of what is noble in human character (cf. p. 418). A fine feeling for the beautiful and admirable side of virtue has commonly been regarded as an aid to moral development. The Greeks, by bringing together under one conception the beautiful and the good (*καλὸς κἀγαθός*), went

further than any others in identifying æsthetic and moral culture. Such identification may, however, be carried too far, and lead (1) either to the undue subordination of art and literature to moral ends, as by Plato in his "Republic"; or (2) to the idea, so popular in Germany at the close of the last century, that the æsthetic or beautiful man necessarily includes the good man. (On the relation of the idea of the beautiful and the good in its educational bearing, see Bruno Meyer, "Das Æsthetische als Erziehungsmittel und Unterrichtsgegenstand, p. 3, etc.)

46 P. 349. Rousseau was strongly of opinion that "the first sense of justice comes to us, not from what we owe to others, but what is owed to us" ("Émile," livre ii). This is going too far, since the sense of *obligation* requires the presence of an authority which can enforce moral rules. At the same time, it is certain that the feeling of right or of justice has one of its roots in the impulse of self-protection. (See J. S. Mill's "Utilitarianism," chap. v.)

47 P. 363. Another illustration from baby life may not be superfluous. A child lying on a hearth-rug, by a random movement happens to kick off its shoe. Taking careful note of so interesting an effect, it proceeds to repeat the action, with the definite intention to bring about the desirable result.

48 P. 373. The educational value of the principle of habit, already touched on (p. 51), has been variously estimated. Locke, as pointed out above, makes it the cardinal principle of intellectual and moral training. (Consult, further, Mr. Quick's edition of the "Thoughts," Introduction, p. liv; and Locke's "Conduct of the Understanding," sect. iv.) Rousseau, on the contrary, bent on developing a free individual, untrammeled by the restrictions of custom and convention, ridicules Locke's idea, and says, facetiously, "The only habit we ought to get children to form is that of having no habits." The bearings of habit on education are discussed by Dr. Carpenter ("Mental Physiology," book i, chap. vii), and still more fully by P. Radestock ("Gewöhuung und ihre Wichtigkeit für die Erziehung").

49 P. 374. The training of the bodily powers was carried to a high degree of perfection by the Greeks, under the name of gymnastics. At the same time, Plato, though not ignoring the value of these exercises as conducive to bodily health and efficiency, esteemed them chiefly as contributing to mental and moral development, by producing such qualities as courage, endurance, and self-assertion. (See Grote's "Plato," iii, pp. 117, 174. Cf. Compayré's "Cours de Péd.," leçon ii). The connection between bodily movement and intellectual develop-

ment was emphasized by Rousseau. According to him, it is the continual exercise of the limbs, under the sole direction of Nature, "which forms in us the only kind of reason of which the first age is susceptible" ("Émile," book ii, p. 117).

50 P. 383. Mrs. Bryant distinguishes obstinacy from self-will pure and simple. The former is set, not only on some particular object, but commonly also on some particular way of securing this. The latter is careless of both so long as self is left free to choose what they shall be ("Educational Ends," p. 21). (For a full account of self-will, see the article, "Wille," Schmid's "Paed. Handbuch.")

51 P. 387. This interconnection of the different forms of self-control illustrates the organic unity of the educational process. Intellectual instruction, by exercising the will (in voluntary attention) and developing habits of industry, orderly arrangement, concern for accuracy, and so forth, is in a measure also moral. Conversely, moral education, by exercising the mind of the pupil in careful reflection, discrimination, etc., is, at the same time, an intellectual discipline. This interdependence of intellectual and moral education is emphasized in an exceptional manner by Mrs. Bryant, "Educational Ends" (conclusion).

52 P. 389. On the different meanings of the term character, and its ethical and educational significance, see the article "Caractère," in Buisson's "Encyclop. de l'Éducation." Cf. A. Martin's "L'Éducation du Caractère," chap. i; and the article "Charakter," in Schmidt's "Paed. Handbuch."

53 P. 392. The outward act of obedience may arise from various internal causes. Thus we may distinguish (1) passive obedience, arising from mere want of will or moral supineness; (2) obedience from personal liking or affection for the person issuing the commands; (3) prudential obedience, which calculates the advantages of conforming and not conforming; and (4) moral obedience in its full sense, which involves a feeling of reverence for authority, and which may be said to shade off from what Kant calls absolute obedience into free intelligent compliance with law. (See articles "Obedience" and "Kant," in the "Cyclopædia of Education"; also the articles "Gehorsam" and "Ungehorsam," in Schmid's "Paed. Handbuch.")

54 P. 394. Miss Edgeworth is here ("Practical Education," chap. ix) referring to the earlier control of the child's movements by others. It is obviously easier to use physical force in checking than in producing a movement. Madame Necker appears also to hold that prohibi-

tions should precede commands, though she is not blind to certain disadvantages in the former (*op. cit.*, iii, chap. ii). At the same time, it is to be pointed out that, when the consciousness of self and the love of liberty are developed, a prohibition is more likely to be resented than a command. The former implies a check to an impulse actually at work. or likely to be so, whereas the latter may be merely suggesting a line of action which the child will be quite ready to adopt. Prohibitions, moreover, have the disadvantage that they are apt to bring before the mind actions of which the child would not otherwise think, and to which, just because they are thus vividly suggested, he feels a perverse inclination. The natural propensity of the human heart to resent prohibitions is cunningly illustrated in a mode of advertisement sometimes adopted in the streets. On the anterior of two boards, carried by a sandwich-man, is printed the prohibition, "Don't look at my back!" where, of course, the real advertisement is to be found. (Cf. Perez, "First Three Years of Childhood," p. 108.)

55 P. 401. This gradual relaxation of discipline makes way for that process of moral self-education on which virtuous character or (to use Kant's language) the good-will immediately depends. (See article " Kant," in Schmid's " Paed. Handbuch," and Madame Necker's " L'Éducation Progressif," i, chap. iv.)

INDEX.

THE END.