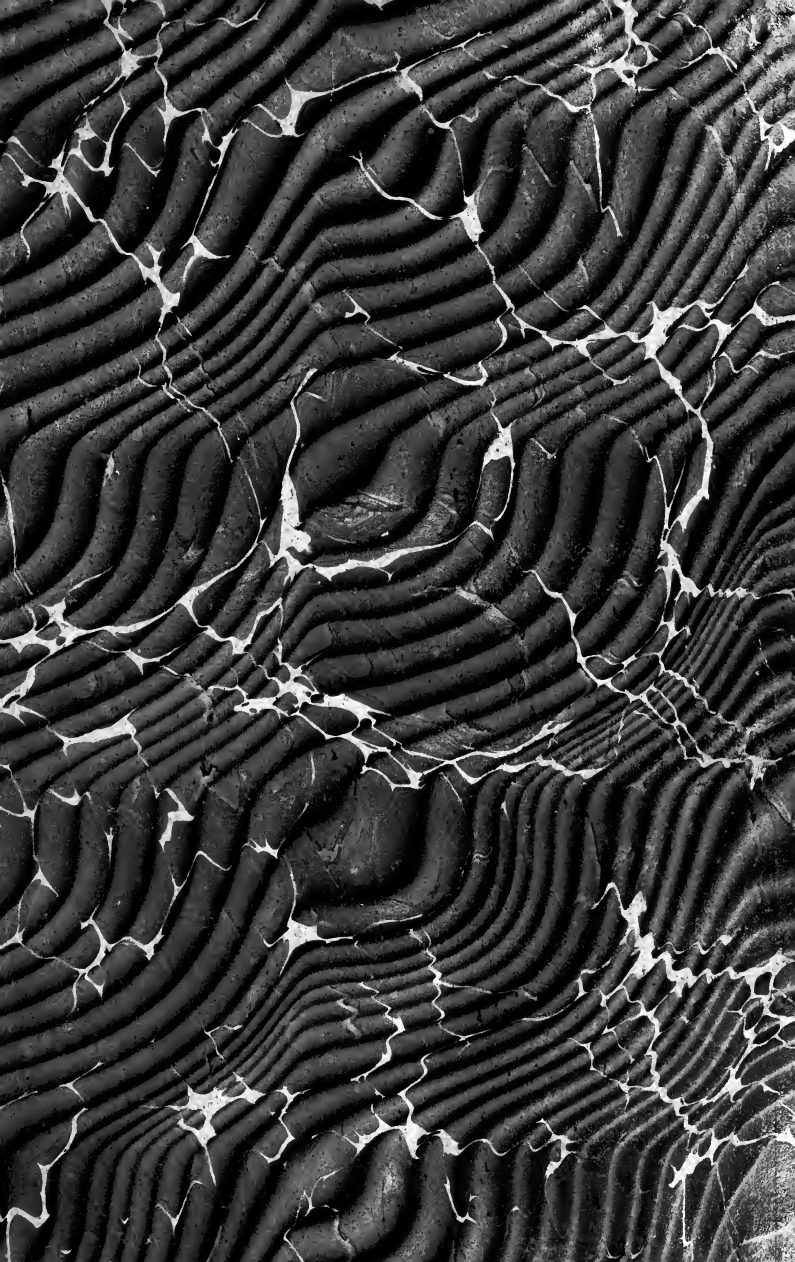

EDUCATION AS ADJUSTMENT

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EDUCATIONAL THEORY

VIEWED IN THE LIGHT OF

CONTEMPORARY THOUGHT

BY

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To my Wife

HARRIET.

PREFACE.

In this volume I have sought to discuss in a rather untechnical and popular way the meaning, aim and general method of education when viewed from the standpoint of contemporary biological, sociological, and psychological thought. It has been my purpose to interpret for a theory of education principles established in several sciences, from which, I think, the educationist must most largely gather the materials for the building of his structure. Whatever originality the book possesses will be found mainly in the manner in which it organizes and interprets data derived from different fields of investigation, and I trust it may in this respect seem, alike to the scientist and to the practical person, to make some slight contribution to a sound philosophy of education.

In Part I. I have thought it desirable to discuss in some detail the methods of procedure which will give reliable results in the treatment of my subject. I wish in this connection to express my belief that the chief obstacle to educational progress is now, as it has always been, the difficulty of discriminating truth from error in the tremendous amount of opinion afloat on this

subject. And the way of salvation lies first of all in the establishment of a scientific attitude of mind on the part of all who have to do with teaching. Let one who does not appreciate this point read some of the things that are written on teaching, or attend a few educational conventions, where gather either teachers or the laity, and he will have an opportunity to see how error is kept alive by people propounding as truth mere opinion born of narrow, one-sided, individual experience. The greatest need in education to-day is the development of the scientific temper among teachers, and the adoption of scientific method by all who treat of educational questions.

In explanation of the character of Part III. I must say that in my opinion the teacher as such can have no interest in formal psychology. He should not be required to spend time in learning the classifications of mental faculties, or even their description, if they are treated, as they so often are in teachers' psychologies, as things of the same order as plants or animals or stars. The teacher needs to get into the habit of looking upon the mind as a dynamic agent, all its processes being determined by the requirements for dealing most economically and efficiently with the world. So it has seemed to me the proper thing to present just so much of psychology as relates to the work of education, and to use terms which would throw emphasis continually upon the *functional* side of mind. If anyone should miss the terms and phrases of formal psychology he will appreciate that my task has not been to classify the faculties of the human mind, but only to suggest how it operates in attaining the great end of educational endeavor. My chief motive in discussing this

topic is to try to show that the doctrine of formal training, which has gained such a prominent place in educational theory and practice, rests upon exceedingly unstable foundations. And I have considered those topics only that seemed to relate to this subject, taking the genetic point of view which I have adopted in my treatment. This will explain why imitation and the emotions do not occupy a more prominent place.

It will perhaps be appropriate to add that the present volume is the first of a series on Education which I have fairly under way, and it is to a certain extent an introduction to later volumes. These treat of the Educational Aspects of Mental Development, the Values of Studies, the Psychology of Method in Teaching, and the Organization and Management of the School. It will be the aim in some of these to apply to the detailed work of teaching the doctrines herein expounded. So it has seemed to me best to confine my discussion in these pages strictly to general principles, leaving matters of detail for other occasions.

It will be apparent to one who reads these pages to whom I am principally beholden for the basal notions upon which the educational doctrines I have set forth are founded. I have drawn freely upon the literature of biology and sociology; but the frequency with which the names of several of our American psychologists and educationists appear will indicate that I am under greatest obligations to these. They give us a conception of human nature which to my mind constitutes a firm foundation upon which the educationist may build.

I wish to acknowledge my indebtedness especially to Professor W. C. Bagley and Professor F. E. Bolton,

for their kindness in reading the manuscript in a careful and critical manner, and for the valuable suggestions I have received from them. My thanks are also due to the Walter Scott Publishing Co., who have permitted me to reproduce three illustrations from Donaldson's "The Growth of the Brain."

M. V. O'SHEA.

MADISON, WIS., July, 1902.

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CHAPTER XV.

EDUCATION AS ADJUSTMENT.

PART I.

THE PRESENT STATUS OF EDUCATION AS A SCIENCE.

CHAPTER I.

THE GENERAL CHARACTER OF THE FIELD OF EDUCATION.

§ 1. A Glance at the Fields of the Several Sciences.

1. If one were to undertake a discussion of geometry he would probably have clearly in mind the general character and the boundaries of his subject. He would know quite definitely what phenomena he ought to examine in the attempt to relate them to one another in a systematic, co-ordinated manner. He would understand, too, what method of procedure in handling his theme would be capable of yielding genuinely reliable results, so that his exposition would be a faithful account of those aspects of the world that he set out to describe. He would, further, have prac-

tical means of determining the validity of his findings, for in the simpler phases of his subject he could test his principles concretely, showing in this way, with sufficient accuracy to lead to conviction, that a straight line is the shortest distance between two points, that the sum of the interior angles of a triangle is equal to two right angles, and so on. In the most intricate parts of his investigation he could satisfy himself of the truth of any proposition by ascertaining if it was founded logically upon propositions already shown to be true, taking it for granted that logical thought is an accurate representation of the order of things in the world with which he deals.

Again, if one were to treat of physics he would find his field marked out for him quite clearly, and he would be able to employ trustworthy methods of investigation and of verification of principles. He would start with the assurance that the part of the world assigned to him for examination could be described in precise terms made intelligible through the experiences of daily life, and his aim would be to give an account of all the phenomena in his department in these terms. In pursuing his inquiry he would produce the phenomena he desired to study under conditions which would permit him to apply some familiar standard of measurement to them. In general his method would consist in first isolating as fully as he could his particular facts from all other facts with which they are combined in a bewildering way in nature, and then he would experiment with them under varying circumstances, so that he could see how they operated in different situations. He would classify them according as they behaved in similar

ways under similar conditions, and he would offer these classifications as the principles of his science. The study of natural phenomena, or more briefly the study of Nature, as Morgan has said,[1] consists mainly in classifying phenomena, reducing them to order, and then giving to the groups of facts thus ordered their simplest expression in what are termed the laws of nature.

2. It must not be thought, of course, that the physicist has ever investigated or ever can investigate all the phenomena in his special field in this exact manner. Some at least of his propositions are but *inferences* based upon conclusions he has reached in his examination of facts kindred to those covered by the inferences. The books on physics make universal statements about heat and light and gravitation that can never be, so far as we can now tell, demonstrated in a universal way, and these must be regarded as simply hypothetical, as Jevons [2] points out. Who has ever shown by conclusive experiment that light travels everywhere at the rate of 300,000 kilometers (approximately) per second? We will be told, it is true, that Roemer and Bradley and Fizeau and Foucault proved this by different methods, and it *must* be true; but still we ask—Have these brilliant investigators, or any others, before or since their time, measured the velocity of light under all possible conditions existing everywhere in the universe? Or have they simply drawn a tremendous deduction from a few highly probable facts respecting the action of light in the laboratory, and between the sun and the

[1] The Springs of Conduct, p. 68.

[2] Principles of Science, Vol. II., Book IV., p. 432.

planet Jupiter, and the earth and some of the distant stars? It is needless to say that we believe this proposition and others like it, but it is not because of complete experimental demonstration that we have faith in it. It is rather because we are so constituted that we must proceed upon the assumption that nature is uniform in her processes at all times and unto the remotest corners of the universe, and certain principles true here and now must under similar conditions be equally true everywhere and to the end of time.[1]

3. If now one goes from geometry and physics over into the field of biology he finds his territory is not very definitely marked off from that of his neighbors; the boundary lines at any rate are in dispute. The physicist and chemist and psychologist declare that they are entitled to a portion of what he may have supposed belonged exclusively to him; and if he accedes to the demands of each of these, and other claimants besides, it is doubtful if he will have much left. Even if he can get his plot fenced off, he is not so fortunate as his fellow-workers in having a well-tested and effective mode of cultivating it in order to produce a good crop. Compared with the fields of geometry and physics the constitution of the soil in this one is not so fully understood. A vastly greater number of elementary substances enter into its composition, and it is not so evident at first glance, or perhaps even after long examination, just how this complex thing should be treated.

The subjects of biological study, as we commonly think of them, are the resultants of chemical and physical and perhaps psychical forces operating together in

[1] Cf. Pearson, in The Grammar of Science, p. 15.

a most involved way. And it is not an easy task to separate these factors from their familiar associates and investigate them under varying conditions,[1] as can be done readily in the physical laboratory. Then, too, on account of the principle of variation, which gets a chance to work in biology, where new individuals are appearing and old ones disappearing all the time, there can be stated but few propositions relating to the nature, the modes of conduct, and the needs of living things which will have validity without qualification in all instances to which they are intended to apply. We declare, without the least fear of contradiction, that everything that lives must breathe and obtain nutrition; but when we get to details in the matter of respiration or diet we find that principles must be qualified in their application to groups or individuals. But we all believe there is no such diversity as this in the operations of inorganic nature. For example, we all agree that a stone would in a given amount of time fall a given distance, whether it be released in America or in Europe or in South Africa, and this is typical of all the propositions of physics.

4. When one attacks the higher branches of biology, sociology[2] for instance, he finds to his dismay ofttimes that his field is still less clearly defined, and the right mode of

[1] Of course a part of the biological field is amenable to definite treatment in a geometrical and physical fashion,—the quantitative part, that which relates to the number and size of objects, their subdivisions, and the mechanical properties of organs, for example.

[2] As this is passing through the press, I have seen Baldwin's Dictionary of Philosophy and Psychology, where sociology is not included among the biological sciences (see Vol. I., p. 119). But it is so regarded by many writers. The point is not material, however, to our present discussion.

investigation still more debatable. If it be said that sociology should concern itself with all the phenomena of society, as Ely [1] maintains, then it may be answered that it is not absolutely certain what is meant by society, or where it begins in the biological scale, or whether all activities whatsoever of human beings are to be included in this study, as Dewey [2] leads us to infer. Again, it is not clear whether the sociologist should confine his efforts to delineating things as they are, or whether he should also point out the goal that society ought to keep in view, and give instructions regarding the manner of attaining thereunto most speedily and comfortably. Surely sociologists have undertaken this larger task—to be teachers as well as narrators and systematizers and explainers of social phenomena. But have they gone beyond the limits of their province when they have acted the part of prophets and moralists, and, in the light of what is, have indicated what should and probably could be?

The physicist never attempts to say what ought to be. He tells his story of what he finds now to be true, and men must make the application to their own daily lives if they so choose. Clifford goes outside the scope of a science like physics when he says that it is not only the getting of knowledge but the using of it to guide the actions of men. Does the mathematician, pure and

[1] Introduction to Political Economy, pt. 1, chap. 1, p. 13 (Chautauqua Series, 1889). See, too, the statement in the Century Dictionary.

[2] See his "My Educational Creed," in Educational Creeds of the Nineteenth Century, where he bases his educational doctrines upon the view that every act of the individual has some social reference. Many men appear to be taking this view to-day.

simple, pay any heed to the utility of the principles he seeks to establish? He never permits the question of what can or ought to be done to engage his attention; if he did he would find himself confronted by far more difficult problems than he ordinarily encounters. The botanist as a scientist is never troubled by the practical questions of what his plants ought to be made to do, or how they can be made to do it. His is the much simpler task of observing what transpires before his eyes, and interpreting it with reference to principles already demonstrated, or of establishing new principles.

But there are probably few botanists who restrict themselves in this way. Whatever logic may say regarding the precise limits of any investigator's province, still the needs of humanity crowd in upon him all the time, and he cannot avoid becoming adviser. The botanist does not leave all matters practical to the horticulturist or the farmer, nor does the sociologist leave to the statesman and the legislator and the politician all suggestions regarding the course which society should pursue. But this carries them into regions where the highways are obscure and the directions are confused, so that it is uncertain where they will come out. They enter a realm where the attainment of exactness of the mathematical sort is impossible by any methods of searching known to-day. Even in the elementary parts of their work they can only approximate to absolute certitude, for the reason that even here the phenomena to be handled are so very complex, every factor collaborating with many others, that it seems utterly beyond human ingenuity to subject them to such minute analysis,

and apply to them such exact standards of measurement, as is done in geometry and physics. The simplest organic object seems far more intricate and complicated in its structure and possibilities than the most complex inorganic thing, even though made by the hand of man.

5. And then the terms in which the sociologist's bit of the world must be described are quite indefinite; they are themselves indeed often exceedingly involved. In physics one may describe a force in phrases that are perfectly definite for every one, and plain enough to be generally comprehended, so that men may adjust themselves to it, intellectually if not organically. But one cannot conceive how the phenomena of human society could be measured mathematically, notwithstanding certain efforts of Comte and Herbart. And even if they could be, would this manner of description make society more intelligible to men than it now is in all its complexity? Sociologists are compelled to employ qualitative rather than quantitative terms, and this implies that the terms are not exactly measured, and so the results of measuring cannot be precise in a mathematical way. When one says that man is "social" in his tendencies, the speaker may understand social in one way, and his hearers may interpret it in a different way. Even with the greatest amount of definition it would in all likelihood be impossible ever to reach a point where absolute identity in understanding would be attained in all minds. And yet we know that the statement is true for the practical life, and we could govern our conduct aright in view of it. It is truthful but not mathematically exact; such a statement

would pass in the sphere of human relationships, but one similar in character would pass in physics.

§ 2. The Field of Education.

6. If the sociologist is thus in doubt regarding the precise limits of his territory, and if he encounters grave difficulties in ascertaining the true character of the things which are found within his range, then the lines of the educationist fall in hard places indeed. Something has been accomplished in outlining the field of sociology, even if all points of contention are not yet settled to the satisfaction of every one concerned. But how much has been achieved thus far in defining the scope of educational inquiry? Those who, even down to our own day, have attempted classifications of the sciences have made no mention of education. One looks through the pages of Bacon, D'Alembert, Locke, Hobbes, Comte, Spencer, and others in the hope that he may find some suggestion regarding the province of education as a branch of scientific investigation, but he has only his pains for his reward. It is true that he will find biology and sociology mentioned in Comte and Spencer and others since their day, and certain subdivisions of these large territories are indicated, but still there is no intimation that education belongs anywhere in the list. It is not fit to be seen in the company of its proud sisters, so it is relegated to the chimney corner.[1]

[1] Pearson (*op. cit.*, p. 526) has made one of the most recent classifications with which I am familiar, and one might suppose he would have alluded to education, but he does not. (Cf. G. A. Cogswell on "The Classification of the Sciences," Philosophical Review for 1899.)

One is led to the view that the opinion has prevailed that education is an art concerned alone with practice and not with a body of principles. But, as a matter of fact, how can there ever be such a situation? In the performance of his art is one not manipulating things in some manner? And is he not either consciously or unconsciously following principles which describe and explain these things in terms which he comprehends and which enable him to adjust himself to them? Does not the mechanic deal with his situations in the light, more or less clear, of propositions which delineate their constitution and possibilities, so that he knows how he must handle them? Does not the farmer do the same, and the physician? And who determines the principles for artisans in different fields? The mechanic is dealing with forces the description of which in some of their aspects belongs especially to physics, but the physicist never describes them in a way adequate to the needs of the engine-builder, for instance. Nor does the mathematician in his geometry or calculus give the civil engineer all that is required to construct a bridge or a railroad. It is true, of course, that the mechanic's art is founded upon physics and the engineer's upon mathematics,[1] but yet the art must have something besides the pure science. Perhaps it would be right to say that the mechanical engineer develops a special department of physics, that department which is concerned with the adaptation of forces to the accomplishment of work of one sort or another, requiring the construction of contrivances to co-ordinate these forces with and adjust them to one

[1] Cf. Pearson, *op. cit.*, p. 509.

another in such a way as to get them acting together toward a desired end.

7. It has been the fashion in certain quarters since the famous attack on pedagogy by the professor of philosophy at Berlin [1] to declaim from the housetops that education can never be made scientific. Professor Dilthey argued that the propositions of pedagogy can never have universal validity, since the conditions under which a principle operates are never the same. People must be taught in particular ways according to the traditions and needs of the locality in which they dwell, the age of the world in which they live, and the degree of development which they have already attained. Education must thus proceed in view of very special rather than general principles, and there is a vast amount which it attempts to deal with that it can never understand with any certainty.

Comte arranged the sciences in a scale depending upon the measure of certitude which belonged to them, which is, as Ward has pointed out,[2] equivalent to arranging them according to their degree of complexity. In this scale education would stand near if not quite at the top as the most complex of all, and so having the least certitude of any. When there is so great complexity it is extremely difficult, if it is possible at all, to determine the force which produces any particular effect; and this has determined the extent to which the sciences treating of human nature have become developed.

[1] Professor Dilthey in his address delivered before the Berlin Academy of Sciences, 1888. Cf. also Royce, "Is there a Science of Education?" Educational Review, Jan. and Feb., 1891, Vol. I., pp. 15–25, and 121–132: and Hinsdale, "The Science and Art of Teaching," in Studies in Education, pp. 91–112.

[2] In the American Journal of Sociology, Vol. I., pp. 16 *et seq.*

Education and mechanics resemble each other in respect of the universality of their principles. The applications of any mechanical law must always be made to fit peculiar conditions. In stating a principle the mechanical engineer never fails to qualify what he says; "*certain conditions being given,*" he declares, "you will always get a certain effect." And Professor Dilthey would be compelled to grant that the educationist can go as far as this. Given precisely similar conditions in any number of educational situations and the application of a certain principle of teaching will be the same in all instances. Of course it is unlikely that we ever get these conditions exactly the same, except in the most general form, as, for instance, in the case that every normal human being seeks to increase his pleasures and decrease his pains, and that he possesses certain mental powers,—the power to perceive, to remember, to reason, although these are not equal in degree or efficiency in different individuals. Again, one can say without qualification in respect of any condition,—age, race, sex, or degree of mental development,—that the mind interprets new objects, comprehends them, through former experience with them, or things akin to them; and one will adjust himself to a present situation in view of the outcome of previous experiments with similar situations. Every scientist will agree to these and other propositions describing uniformities in the behavior of human beings, and these may constitute the basal principles upon which the educational structure may be reared.

8. The question which the educationist is called upon to answer is, Can I present certain principles in my

special field which faithfully portray a phase of the world not previously described by some one else? The question contains no allusion to how much or how little can be presented; it simply requires that whatever is offered must be truthful to objective fact. It does not contemplate, either, that the principles so offered shall have universal and unqualified application, for a principle may itself provide for modification under different conditions and in special situations. This must be the case with all complex phenomena.

So if education presents the doctrine, to name but one here, that the aim of education is adaptation to environments, this would certainly have to be specially interpreted in special situations. In Cicero's time the aim of education must have been adaptation to environments, but the environments which the Roman encountered and the complexity of adaptation required were not just the same as in the days and in the land of Aristotle; surely not the same as in the days and in the land of George Washington or Herbert Spencer. The social environment to be dealt with changes in character with the evolution of the race, and varies with the different races; the physical environment is modified by the locality, and so on. But our general principle, as a type of educational propositions, is none the less scientific because it has not just the same application in all instances, though it may be less mathematical, less perspicacious, more complex and indeterminate on this account.

CHAPTER II.

EFFECTIVE METHOD IN EDUCATION.

§ 1. The Requirements of Effective Method.

9. The absorbing ambition of the scientist is to *get at the truth;* to determine precisely what things are and in what way phenomena occur. And what are the methods which if faithfully pursued will lead one to truth? Aristotle asked this question in ancient days and answered it,[1] in a way at any rate. He saw that man's spontaneous, off-hand judgments cannot be depended upon, for they are as likely as not to be based upon prejudice. The experience of the ages has only confirmed what Cicero said more than twenty centuries ago,—that people do not commonly appraise things at their just value; rather they allow their prejudices to rule their judgments.[2] Aristotle realized that the individual observer in his contact with the world about him sees things in an individual way, depending upon a vast number of conditions which have contributed to form his particular mental constitution. If he has been a slave, for instance, he sees

[1] See Davidson, *op. cit.*, chap. on Aristotle. See also an article in the Encyclopædia Britannica, ninth edition, Vol. II., pp. 510–523.

[2] Cf. Voltaire, La Fanatisme, II., 4, for a lively discussion of the influence of prejudice on right judgment.

the world from the slave's point of view. He does not see things in their proper setting, but divorces them from their accompaniments in the real world, and so does not attach to them a proper value. On the other hand, how different is the world which the master sees? He opens his eyes upon the same environment but he does not behold the same scenes, for he interprets what lies before him in a very different way from his slave. Pass the world through the minds of two men who do not purge their mental vision of phantoms, and you will not recognize it as the same object when it comes out. On this account, then, man's spontaneous judgment is not to be trusted; he is not likely without special precaution to discern truth with an unprejudiced eye. He cannot eliminate self from the process, as Morgan would say.

So Aristotle, realizing this more or less explicitly, saw that in order to reach truth the investigator must adopt a mode of looking at the world wherein his prejudices will, to the fullest possible extent, be held in check, so that he may see things in their true light, and not distorted by his personal bias. The personal element must be thrust aside. The mind must be held up to nature until it beholds her in her true forms, and classifies and co-ordinates her varied activities so that uniformity may be made to appear in the midst of distracting diversities. Mere opinion is not wanted, for

> "Opinion's but a fool that makes us scan
> The outward habit by the inward man." [1]

Aristotle argued that one could not discover truth by the dialectic process; the dialectician is a mere formalist who manipulates empty words. One must go to nature

[1] Pericles, act II., scene 2, p. 56.

if he would reach truths which will be of value for practice. Thus he was led to adopt the inductive method, by employing which he would be more likely to let things impress themselves upon him in the way and in the order in which they exist in the world, so that in his classifications he would be faithful to the objective order of the universe.

10. All investigation meriting the good name of science must, we think to-day, be conducted in the spirit if not according to the exact letter of this method. We have come to be suspicious of all theories in any field which have not been derived in this critical manner. Men have thought crookedly for so long a time and in respect of all things both natural and human that we may well distrust any individual who professes to have discovered truth, if he has not adopted that mode of research which alone has been found capable of yielding reliable results. People have had enough and too much of alchemy and astrology and chiromancy and things of that sort; and they have had enough too of the method of looking at the world which produced these pseudo-sciences. Speculation divorced from precise observation; metaphysical and logical argument [1] about what

[1] Goethe realized that much philosophizing is but the manipulation of words, and empty, barren words, too. He says in Faust:

> "The best thing that the case affords
> Is—stick to some one Doctor's words:
> Maintain his doctrines out and out,
> Admit no qualifying doubt;
> But stick to words, at any rate:
> Their magic makes the temple gate
> Of Certainty fly safely ope;
> Words, words alone, are your best hope.

ought to be true no longer appeals to men. Maudsley's criticism[1] of the speculative, verbal study of human nature, and the suggestion of a better one, may not be out of place here. "I must confess," he says, "to being unable to use their (the philosophers') language with a satisfactory sense of having clear and definite ideas beneath its terms, to having no proper faith in their methods, and to having failed to gather from their works fruits of any practical use."

§ 2. The Methods Pursued by Educationists of the Past.

11. Has the educationist complied with the requirements of effective method in the elaboration of his principles? Plato, the first to treat education in a serious manner, maintains in the Protagoras,[2] that the child ought to be instructed regarding what is just and unjust and honorable and disgraceful, and that if he does not yield obedience he must be coerced into it. When the boy goes to school he must be made to learn by heart what is good in the poets, and must in time

Stu. But in each word must be a thought—

Meph. There is, or we may so assume—
Not always found, nor always sought—
While words—mere words—supply its room.
Words answer well when men enlist 'em,
In building up a favorite system:
With words men dogmatize, deceive;
With words dispute, on words believe;
And be the meaning much or little,
The words can lose nor jot nor tittle."

[1] Body and Will, pp. v. and vi., Introduction.

[2] Pp. 203–205, translated by Wright. Macmillan & Co., 1888.

have music and gymnastics. Plato argues elsewhere[1] that only the narrative form of story-telling should be allowed; that the Ionian and Lydian harmonies should not be heard by the young, only the Dorian and Phrygian styles; that all musical instruments except the lyre, the guitar, and the pipe, and all complex rhythms should be prohibited; that the studies of the school should include simply arithmetic, geometry, and astronomy.

He is treating here of exceedingly complex matters, so complex indeed that when viewed from the standpoint of modern experimental science it seems quite impossible to subject them to scientific experiment. Certainly Plato did not isolate the separate factors involved in these intricate processes, and ascertain their effects in many particular instances, and thus by a process of long induction reach the generalizations which he presents. He reached them by another but perhaps less difficult route. To begin with, he had before him the educational practices of his people; he saw with greater or less clearness the outcome of a certain *régime* even though he had not deliberately analyzed the factors which produced the results. Then, further, he had reflected upon the characteristics of human nature, making direct observations to some extent, and deducing in other instances principles from philosophic premises, some of which were handed down to him by preceding philosophers, and others of which were the fruit of his own thinking, and the intellectual complement of his religious hopes and beliefs. Then he looked upon the educational process and interpreted the prob-

[1] In the Republic, pp. 64–116, and 221–269, Davies and Vaughn translation. Macmillan & Co., 1888.

lems there presented in the light of the wisdom he had gained in his philosophic reflections, and his observations upon the education of his time.

When he urged that the child ought to be told what is just and holy, that he ought to be whipped if he did not obey, he followed the method of reaching conclusions which the race has pursued in developing much of its practical philosophy,—getting at unknown things by tracing likenesses in them to things that are already understood, or at least are believed. If the tree of the physical world that we see and experiment upon directly does not start out straight you must bend it back; you must use force to straighten it up. So if the tree of the mental world does not grow straight according to the philosopher's conception of psychical straightness, it should then be forced back into the line of action that is deemed best.[1] So to be *told* what is just and holy will lead to a just and holy life. There is little tendency in this mode of proceeding to try a principle for a long time to see how it actually works; it is *a priori* reasoning largely, the mind resting assured that it has reached

[1] The tendency to explain mental phenomena in terms of physical occurrences has been a very serious obstacle to the scientific study of human nature. Our psychology and educational philosophy are full of terms denoting purely physical processes. Granger comments upon this fact, saying "dangerous suppositions still lurk in the application of metaphors drawn from the commoner movements, as, for instance, grasping, weighing, apprehending, and so on; here we are led to think of the mind as a workman standing outside of, and having a separate existence from, his work. Physiological expressions are dangerous, too, when transferred from the nervous process to the mental one. Recently a physician, lecturing in one of the older universities to teachers, defined thought to consist in 'the formation of the union of cells.'"—*Psychology*, p. 4.

the right goal when it has gotten the problematical thing into a general system of theoretical philosophy which it regards as founded upon the rock of truth.

12. So this is Plato's method, and it is the method, too, of all his contemporaries and followers, except Aristotle, who, as we have seen, was inclined to investigate things directly. He had less faith than his fellow-philosophers in the value of interpreting the world by means of dogmas which had been elaborated in some way or another apart from direct examination of the concrete realities to which they related.

13. When we come down to the reformers who were governed in their theories and practices respecting education, as well as other matters, by the spirit of the Renaissance, we seem to discern in Erasmus[1] and his contemporaries a prophecy of what is to come. There is apparent in these men a tendency to go directly to the world to find out what it is and how it behaves itself. This tendency is marked in an emphatic way when we come to Rabelais and to Montaigne, the first realists, so called, in education. There can, of course, be no mistaking Locke's attitude and spirit as an investigator, though he did not gain his facts regarding education in such a careful and extensive way as genuine scientific method demands,[2] nor was he cautious enough in drawing his conclusions.

14. In more recent times we can see the spirit of genuine inquiry in things educational gradually

[1] See three articles in the Encyclopædia Britannica, ninth edition—Erasmus; The Renaissance; Scholasticism. See also Quick, Educational Reformers, chaps. 1 and 2; and Davidson, A History of Education, Book II., Division II., chap. 4.

[2] See his Thoughts on Education, edited by Quick.

gaining supremacy, although there is a long struggle ahead. Doubtless people would differ widely regarding the merit of Rousseau's Émile;[1] but all acknowledge that it shows a feeling at least for things as they are, and to a greater or less extent the power of handling them so as to discover the laws which bind them together. Yet Rousseau is not an impartial, critical observer and a careful generalizer. In this connection many readers will doubtless think of Basedow[2] and his Philanthropinum as an illustration of thorough scientific method in education, but too much ought not to be claimed for the man and his work. After all he is hardly a student of education according to a strict method of induction or experiment. The Philanthropinum was not a laboratory; it did not take up problems of teaching in an experimental way. Basedow did not attack education without preconceptions. The Philanthropinum was simply a material expression of doctrines which he had formed in other ways. This does not call in question the value of his institution in the history of education; it merely assigns it a proper place as a scientific establishment.

15. And so passing on to Pestalozzi[3] and Froebel,[4] it is not recorded of either that he used his school for the purpose that the physicist or biologist uses his laboratory. Yet every one will grant that there is something of the scientific atmosphere enveloping their work. There

[1] See the Émile, translated by Eleanor Worthington.

[2] See Quick, Essays on Educational Reformers, Essay on Basedow.

[3] See his Leonard and Gertrude, translated by Eva Channing.

[4] See The Education of Man.

is a sense of the reality of the objective world, and of the necessity of coming face to face with it in order to discover what it is. Of course there is an almost complete lack of purging the mind of preconceptions, in the educational theorizing of Froebel especially. He came up to the study of the problems of education filled with the Schelling symbolic philosophy, and saw everything human in the light of it. That he discerned truthfully some of the attributes of childhood and the proper modes of influencing it every one will probably grant. But in so far as his fundamental conception of the nature and powers of the human mind was at fault, just in that measure he went astray in his doctrine concerning the materials and methods best adapted to the instruction of the young.

§ 3. The Methods of Educationists of Our Own Times.

16. And so as we come down to our own day we find that while the scientific attitude in education is becoming more and more prominent, still a large part of educational theory shows what must be regarded as marked personal bias. Consider the reason why men differ so widely in their views; is it not due in large part to the fact that they have not investigated the questions at issue in that impersonal, self-eliminated, unprejudiced way that gives to physics and chemistry and biology such definiteness and certitude? See, for instance, Herbert Spencer, in terms with which every one is familiar, lauding science as an instrument of education; while Fouillée, the French philosopher, speaks of it in depreciatory terms.[1] "I learn

[1] Education from a National Standpoint, p. 61.

arithmetic," he says, "because some day it will be useful to me to know how to count; I learn physics because it will be useful to me to know the properties of bodies; I learn mechanics because the subject is useful in making machines; I learn natural history because it is useful in hygiene and in medicine; I learn geography because it is useful to know about different countries, and because it is said to be useful in times of war, etc. The child thus runs the risk of taking *self-interest* as the universal standard, and the more our curricula are overloaded with unconnected special sciences the less educative virtue they have." It is significant that the scientists usually vote for science in the curriculum and the classicists against it. Huxley[1] argues with all his might for a scientific education, and Matthew Arnold[2] argues just as passionately against it,—or at least for something in its place. The latter expresses the fear that science will blunt the fine faculties, and render one indifferent to the well-being of his fellows; while Spencer finds in it a source alike of great social and religious value. Fouillée thinks the method of any science but mathematics is worthless, while Pearson[3] expresses a diametrically opposite opinion, holding that investigation in science and the diffusion of scientific knowledge will develop mental habits which will promote better citizenship and lead to a more stable form of government. He maintains what many believe, that after a scientific training one is less apt to be led astray by passion or by the appearance of things. Science develops

[1] See his Education and Science.

[2] See his A French Eton; Middle Class Education and the State.

[3] *Op. cit.*, p. 9.

a tendency to examine facts critically and handle them impartially, and this is the best training for a free citizen.

17. And so every study has its friends and its enemies, its supporters and its defamers, many of the opinions expressed regarding them reflecting individual experiences merely. One is forced to the view that little pains have been taken ordinarily to divest the mind of idols. Men when they discuss education are often really pleaders, advocates, partisans, not scientists. Spencer, as every one knows, thought classical study of practically no consequence. The discipline it gives could be got as well in studying Choctaw, or memorizing the names in a city directory. Fouillée, on the contrary, thinks most highly of the classics. He says[1] that in translating a pupil must examine every word with critical care to determine just what it means, and to find a word in his own language which will exactly express the thought. In ferreting out the hidden meaning of a sentence he must see the connection between all the words and the specific ideas which they denote, and as a final act put the whole thing over into another language. In doing this he makes the thought of the author his own; he lives over the experiences of the writer; he grows into possession of all the author possesses.

18. If one will look over the opinions of great Englishmen (not to mention people of other countries) who have indicated their views of the value of classics he will find them arrayed in almost equal numbers on opposite sides of the question. "On the one side contending with impassioned ardor for the superiority of the class-

[1] *Op. cit.*, p. 108.

ics, maintaining by elaborate argument that they alone form the basis for a liberal training and that no person lacking familiarity with them can lay claims to being cultured,—holding these views may be found Mill, Newman, Bishop Temple, Martineau, and Gladstone. On the other side, protesting with equal vigor against the time consumed in the study of ancient languages, declaring in the most vigorous terms that it is alike a waste of energy and a hindrance to the broadest expansion of the soul,—on this side may be found Locke, De Quincey, Carlyle, Spencer, Froude, and Bain."[1] As a contrast to the unstinted praise that has been meted out to classical education in our times we have Carlyle's "Gerund Grinder"; and Sidney Smith paints in sombre colors a picture of the English schoolboy,—"full of animal spirits, set down on a bright sunny day, with a heap of unknown words before him, to be turned into English before supper by the help of a ponderous dictionary alone."[2]

19. It ought not to be necessary to produce further evidence to show that it is the common thing for a man's principles of education to be determined by his particular interests and inclinations.[3] One trained as a scientist, and making his living in this field, is apt to see

[1] O'Shea, Relative Values in Secondary and Higher Education,—a paper read before the North Central Association of Colleges and Preparatory Schools, April 2, 1898, and printed in the School Review for May, 1898.

[2] Quoted by Spencer, Aims and Practice of Teaching, p. 62.

[3] See papers in Youmans, *op. cit.*, and Farrar (editor), Essays on a Liberal Education, for illustrations in addition to those that have been given of radically different opinions on the same topic, the scientists lauding science, and the ancients for the most part singing the praises of the dead languages.

education, in some of its phases at any rate, in a different light from one reared in the atmosphere of the classics. There has been too great an admixture of prejudice in the outcome of research, or one ought to say in the formation of opinion; for there has been next to no research in the proper sense of the term. In these matters which touch one's interests so vitally, which seem to call in question the character of his upbringing, or which involve the bread-and-butter problem immediately or remotely,—in such matters judgment is especially liable to go astray, and scientific method alone will bring anything like truthful results.

CHAPTER III.

THE DATA FOR A SCIENCE OF EDUCATION.

§ 1. The Survival of the Fittest in Education.

20. While little value should be attached to individual opinion in education, still it seems different with principles that have lived throughout the history of the race, and that have been repeated in one form or another by all great thinkers, however much they may have differed in matters of detail. Is it safe to say that articles of belief in education which have been held by generation after generation, and tested by them, and are as fresh to-day as ever,—is it safe to say that such principles are scientific? that they express in a truthful way certain relations of the race to the world? Perhaps the logician and the evolutionist would not agree on this point; the former might, indeed he would be likely to, demand that all principles accepted as scientific should be demonstrated in an explicit manner according to the requirements of induction. He would doubtless attach little importance to the age-quality of any proposition; if it wishes to be admitted into the ranks of science it must show its credentials, all set out in black and white. The evolutionist, on the other hand, would be inclined to recognize the claims of principles that have held their own throughout the ups and downs

of humanity, even if a clear account of their establishment cannot be given. These he would be apt to think probably express the highest truth which the race can attain; they must possess genuine worth, and represent the world and man's relation to it in a truthful manner or they would not have survived.

And have not such principles really been established in conformity to the requirements of effective method? Every induction in any field and at any time leads at first to an hypothesis, which does not become a law until it is tried under varying circumstances and not found wanting. Newton thus formulated the principle of gravitation first as an hypothesis; men have been working with it since, and to-day they believe it is a law, for it has never failed to work in any situation in which it has been tried. So men have been working with certain principles of education for a much longer period than they have worked with the law of gravitation, and they have stood the test.

Spencer seems to have the right on his side when he says that whatever has for a long period met with the approval of the wise and the good has, in all likelihood, much truth in it. Payne, too, puts the matter[1] in the proper light in saying that the keenest minds of all ages and countries have devoted themselves to a study of human nature, and there has never been a time when the ablest people have not been striving to solve educational problems. It is impossible to think that they have not accomplished something of real value which makes it unnecessary for the educationist of to-day to start from the very beginning. Perhaps he

[1] Contributions to the Science of Education, p. vi.

goes too far in saying that the "main data for the establishment of a rational art of education are now found in the current systems of philosophy and psychology—and there really exist a sufficient number of such data to lay the foundations of a science of education"; but if this is an overstatement of the case it is certainly just as much an understatement to say that there is nothing of worth to be gained from the reflections and investigations of the great thinkers of all times.

21. Some at least of the principles which were announced by Plato[1] have been repeated by every eminent educator since his time, and they are maintained as vigorously to-day as when they came from the pen of their author; and, moreover, scientific experiment, as we shall try to show in due season, is corroborating a considerable part of the small body of doctrines that have come up to us unchanged through the storm and stress of the ages. Again, if one will compare some of Aristotle's educational doctrines with those advocated to-day he will be struck with the similarity in many fundamental respects. He says,[2] among other things, "It is of great importance that children should make those motions that are appropriate to their stage of development. . . . Whatever it is possible to inure children to, they ought to be subjected to from the very outset, and gradual progress to be made. . . . Care must be taken that their games shall be neither unrefined, laborious, nor languid. As to the conversation and stories which children are to hear . . . it ought to be seen that all such things tend to pave the way for

[1] See the Republic, pp. 64–116 and 221–269, Davies and Vaughn Translation.

[2] The Politics, Jowett's Translation, Book VII., chap. 17.

future avocations. As to the screaming and crying of children, they are things that ought not to be prohibited, as they are in some places. They contribute to the growth of the body by acting as a sort of gymnastics. As to foul language, it ought, of course, like everything else that is foul, to be prohibited in all society (for frivolous impurity of talk easily leads to impurity of action), but above all, in the society of the young, so that they may neither hear nor utter any such things."

How modern Locke seems! One might think some present-day child-study enthusiast, imbued with the doctrines of the new psychology, was expressing his views. See, too, how thoroughly in accord with the best thought in all ages is the following doctrine of method in teaching, advocated by Aristotle: ". . . music will have a much greater effect in moulding people, if they take part in the performance themselves. Indeed it is difficult, or even impossible, for those who do not learn to do things themselves to be good judges of them when they are done." [1] "Learn to do by doing" is the watchword which has been called out by one after another of the great masters of thought ever since the learned Greek's time, and it is the leading principle of our educational philosophy to-day. Will one go astray if he exalts such a principle in his educational theory to the certainty of a law of gravitation, especially when it is endorsed by a number of sciences treating of the nature of a human being from different standpoints? [2]

[1] *Op. cit.*, Book VIII.

[2] Our present-day research in human development is not changing materially the scheme relating to the great epochs of growth in the individual set forth by Aristotle: (1) Child-

22. There is probably no more effective means of discriminating truth from error in matters pertaining to human nature than in subjecting a principle to the test of practice. If a doctrine is right, it will weather all storms; if not, it will be cast aside in the long run. And education is especially favored in respect of the material which has been produced for natural selection to work upon, since the greatest concern of the race has always been the education of the young, whether this has been explicitly recognized or not; and as an outcome of the winnowing process there have come down to us a few principles which are entitled to the rank of genuine truth.

As we have seen, the experimentalist hesitates to attach value to anything except the results of conscious, explicit, deliberate investigation, wherein all the antecedents and concomitants of things have been taken due account of, and they all appear in the final statement. He does not recognize that in our reactions to things with which we are dealing all the time we gradually arrive at generalizations in a subconscious way, so that we cannot give an account of the details of the process. But the psychologist takes the ground that the principle expressing the outcome of this more or less unconscious experimentation may often repre-

hood, extending from birth to the end of the seventh year, and spent in healthy growing, and latterly in preparation for discipline; (2) Boyhood, from the beginning of the eighth year to the advent of puberty, devoted to the lighter forms of discipline, bodily and mental; (3) Youth, from the age of puberty to the end of the twenty-first year, occupied with the severer forms of discipline; (4) Manhood, devoted to State duties. See the results of recent study of this subject summarized by Bryan, Pedagogical Seminary, Vol. VII., pp. 357–396.

sent the highest kind of truth. In our efforts to get adjusted to the world our experiences lead us to appraise in an appropriate manner different sorts of conduct according to their outcome upon our happiness; and in oft-recurring situations there is offered opportunity for the institution of definite modes of behavior, which in the intellectual life are represented by articles of belief, and in a science of human nature they ought to denote principles in which one may place much confidence.

23. Then see what a wealth of material of this character the educator has at his disposal in the experiments that have been made by nations in putting to the test different systems of education. He has before him, though in a complex and confused condition, the main results of Spartan and Athenian and Roman and Chinese and Mediæval and Spanish and German and Russian and perhaps American education as types. Of course many will shake their heads; they will say that no one can disentangle the forces which have co-operated to produce certain characteristics in individual or in national life, and their contention doubtless has some basis in fact. When we see that different people ascribe the qualities of Spartans, for example, to various causes, some to peculiarities of education, some to influences of environment, some to native temperament of the people, some to religious ideals, and so on,—this fact shows how difficult it is to determine just what has been the effect on national life of any particular educational practice.

It is held by some that the arrest in the development of the Orientals has been due to a lack of contact with the concrete, actual world which the

educational methods of progressive nations secure for their youth. The Chinese pupil, it is said, is kept memorizing symbols all his years, and is as ignorant today of the world around him as his ancestors were three thousand years ago. Others maintain that the arrest in Chinese civilization has been due to the character of their food; to their total isolation from the civilizations around them; to their native incapacity; and so it goes. How can we say what force has pushed England to the front, and what one has compelled China to remain far in the rear? or have many forces operated together? Does an understanding of the world in which one lives—the social, the æsthetic, and the physical world—lead to improvement in foods and modes of life? Does it take people out beyond their borders to associate with other people, and so find out what they know and what they do?

In the present state of our knowledge there is no absolute, definite answer that can be made in any individual instance. But here again it is possible to see that a certain outcome in national achievement and prosperity is generally associated with certain educational practices, and it seems probable that the two are connected as cause and effect. Then if the light thus given harmonizes with that radiated from other sources, are we going too far in saying that the principle involved is demonstrated as fully as we can ever prove anything in any department of human nature? If history in any of its ramifications can be regarded as scientific, or sociology, or political economy,—sciences which base their principles upon the outcome of human conduct in the past, the first entirely, and the others partly,—if these can be called scientific, then education which can

make use of the data which these subjects employ certainly ought to achieve the same degree of accuracy in its results. "*Der Historiker ist ein rückwärts gekehrter Prophet,*" Schlegel says; and he is able to prophesy because he has discovered certain uniformities in human nature, and he knows how phenomena within the range of these must occur—and this is science of the first quality.

§ 2. Data Derived from Biography.

24. Every adult presents in his conduct the results of some sort of an educational regimen; his character is but the last term in a series of causes and effects. We see what the man is and what he can do; and his facility in adjusting himself well to his fellows and to nature affords a standard by which to estimate the value of his early schooling. We encounter here, of course, the difficulty which we have met elsewhere. In dealing with such complex matters we cannot estimate precisely the influence of each factor which has contributed to the total result. We cannot agree upon just what influences contributed to mould the characters of Homer and Cæsar and Cicero; Shakespeare and Spencer; Grant and Lincoln; but still, by the method of comparison as it has been employed in handling other kinds of data, we may reach conclusions of positive value. When the educational principles indicated in the history of any single life are indicated as well in the history of other individual lives and of national life, and are endorsed by experiment and the doctrines of psychology, we are not too presumptive in asking that they be admitted to the rank of scientific truth.

It may be said, and with truth, that we have but few

reliable records of the careers of individual men, and such records as we have even do not specify in much detail the character of the subjects' educational training and the outcome. But yet we are not left altogether empty-handed, by any means. The educationist has access to all that the historians know regarding the men and women of the past, and he has before him in concrete form the men and women now living so that he may study his subject at first hand, and much is being attempted in this direction to-day. Then there are autobiographies, like those of Mill,[1] Pierre Loti,[2] Bashkirtseff,[3] Burnett,[4] Washington,[5] Winslow,[6] and Tolstoï,[7] and they have indicated in some detail their educational training, and the effects, so far as they can themselves trace them, upon their after lives. Again, a number of intelligent men in our own country have told us[8] how they were educated, and what they believed to be the value of certain studies and methods. Then, too, Galton,[9] Candolle,[10] Yoder,[11] and others have

[1] Autobiography. New York, 1887.

[2] The Romance of a Child, translated by Watkins. Chicago, 1891.

[3] Journal, translated by Hall and Heckel. Chicago, 1890.

[4] The One I Knew Best of All.

[5] Up from Slavery: An Autobiography. New York, 1901.

[6] Diary of Anna Green Winslow, a Boston School Girl. Boston, 1894.

[7] Childhood, Boyhood, Youth; translated by Hapgood. New York, 1886.

[8] In the "How I was Educated" Papers.

[9] See English Men of Science, their Nature and Nurture, chap. 1.

[10] Histoire des Sciences et des Savants depuis deux Siècles. Gèneve, 1873.

[11] Story of the Boyhood of Great Men; Pedagogical Seminary, Vol. III., pp. 134 *et seq.*

carefully worked out the lives of distinguished men with the special purpose of estimating the results of different modes of educational training, and these data are, as far as they go, of genuine worth. They furnish some evidence regarding the value of different branches of instruction for persons in different walks of life. They indicate the effects upon after years of different methods of school discipline. They show the virtues and the failings of personal characteristics in teachers. In short, biography reveals to us in a real, even if not in a very detailed way, the sort of structure that is produced by following certain architectural plans and modes of building in education.

§ 3. Experimentation in Education.

25. But still information derived from these sources lacks the fulness and definiteness and accuracy of experimental data. Men have come to appreciate this, and we see about us to-day great interest and activity in the experimental investigation of educational questions. The methods of the laboratory are coming to be employed in the study of education, and already a few at least of the problems encountered in the school have been carefully studied by precise methods. For illustration, take the subject of language instruction; the teacher seeks to so train his pupils that they may master language most effectively as an instrument for the gaining and communicating of thought, and he is anxious to accomplish this in the most economical and effective manner. Now, when shall the pupil enter upon this study? What phase of the subject shall he attack first? How

shall he move on to it? What tactics shall he employ in overcoming it? We are getting some data of scientific value relating to these matters. Shall the pupil be introduced to the letter, the word, or the sentence first? Some of the elementary factors in this problem have been studied experimentally by Cattell,[1] Grashey,[2] Goldscheider and Muller,[3] Quantz,[4] Bagley,[5] Pillsbury,[6] Bryan and Harter,[7] and others. The investigations on the pathology of language, on aphasia, which have been conducted in recent years have given much information bearing upon the problems of language teaching,—such information as is given by Elder,[8] Collins,[9] Bawden,[10] and others. The observation of children learning language will yield

[1] Ueber die Zeit der Erkennung und Benennung, etc., Philosophische Studien, Vol. I., pp. 635 *et seq.*

[2] Ueber Aphasie und ihre Beziehung zur Wahrnehmung Archiv. für Psych. und Nervenkrankheit, Vol. XVI., pp. 654 *et seq.*

[3] Zur Psychologie und Pathologie des Lesens, Zeitschrift für klinische Medicine Vol. XXIII., pp. 130 *et seq.*

[4] Problems in the Psychology of Reading. Monograph Supplement to the Psychological Review, Vol. II., No. 1.

[5] The Apperception of the Spoken Sentence; A Study in the Psychology of Language, American Journal of Psychology, Vol. XII, No. 1, and Reprint.

[6] The Reading of Words. American Journal of Psychology, Vol. XII.

[7] Studies in the Physiology and Psychology of the Telegraphic Language, Psychological Review, Vol. IV., No. 1, and Reprint; and Studies on the Telegraphic Language, Psychological Review, Vol. VI., No. 4, and Reprint.

[8] Aphasia and the Cerebral Speech Mechanism.

[9] The Genesis and Dissolution of the Faculty of Speech.

[10] A Study of Lapses, Monograph Supplement to the Psychological Review, Vol. III., No. 4.

data of scientific worth for education, and much reliable work of this character has already been done by Preyer,[1] Shinn,[2] Hall,[3] Perez,[4] Tracy,[5] Lukens,[6] Kirkpatrick,[7] Dewey,[8] Sully,[9] Taine,[10] and others.

26. And then consider the amount of material on the teaching of language which has been produced by teachers of the subject, and by expert students, testing the matter in the schoolroom in experimental classes, and observing the outcome of different methods under varying conditions. Much of this latter kind of material is doubtless of little scientific value; but on the other hand a considerable portion of it has been gained with quite as scrupulous regard for scientific method, perhaps, as Darwin observed in gathering the data for his great Origin of Species, or Spencer in gathering the data for any of his treatises, or as the sociologist or pathologist of to-day observes

[1] The Mind of the Child; Development of the Intellect. (Part II., Of The Mind of the Child.) Translated by H. W. Brown.

[2] Notes on the Development of a Child; and the Biography of a Baby.

[3] First Five Hundred Days of a Child's Life, Child Study Monthly, Vol. II., pp. 330 *et seq.*, 394 *et seq.*, 458 *et seq.*, 522 *et seq.*, 586 *et seq.*, and 650 *et seq.*

[4] The First Three Years of Childhood. Translated by Christie.

[5] The Language of Childhood, American Journal of Psychology, Vol. VI., pp. 107 *et seq.*

[6] A Preliminary Report on the Learning of Language, Pedagogical Seminary, Vol. II., pp. 424 *et seq.*

[7] How Children Learn to Talk, Science, September, 1891.

[8] The Psychology of Infant Language, Psychological Review, Vol. I., pp. 63 *et seq.*

[9] Studies of Childhood, chap. 5.

[10] Lingual Development in Boyhood, Popular Science Monthly, Vol. IX., p. 129.

in his investigations of the phenomena in his field. For example, take the material relating to the teaching of the mother tongue contributed by Hall,[1] Hinsdale,[2] March,[3] Jacobi,[4] McMurry,[5] Scudder,[6] Bain,[7] Laurie,[8] and Balliet.[9] These observers are dealing directly and constantly with the matters of which they treat. The educationist working in this way often comes into more direct contact with his material than does the historian or the sociologist, or even the biologist in a considerable part of his work.

27. But yet it must be acknowledged that, when compared with the other sciences, very little of genuine worth regarding the value of studies, and the modes of treating them to develop their full value, is coming to us from any source. The men in the normal schools are not utilizing their unsurpassed opportunities to observe the outcome of studies and methods upon developing children. These schools are, theoretically, research schools in part or laboratories where the conditions needful for investigation of a high order are supplied,—where problems may be simplified and the operation of individual factors in the teaching process observed. They are supposed to be the exper-

[1] How to Teach Reading.

[2] Teaching the Language-arts: Speech, Reading, Composition.

[3] The Spelling Reform. Bureau of Education, Washington. 1893.

[4] Physiological Notes on Primary Education.

[5] Special Method in Reading.

[6] Literature in the Schools.

[7] On Teaching English.

[8] Lectures on Language and Linguistic Method.

[9] Association of Ideas in Reading, Add. and Proc. N.E.A., 1893, pp. 756–760.

imental stations in teaching, and education is more liberally supplied with them than is agriculture or biology or medicine. In 1898 there were in the United States alone above three hundred[1] of these institutions, public and private; and if but one-fifth of them should undertake scientific work, still this number ought to achieve very important results.

But the normal school belongs very largely to the genus *shop* rather than to the genus *laboratory.* It spends its energies in applying what it thinks is truth rather than in adding to the body of truth, or even in testing in any critical way what it has inherited from times past. And yet it may be said in justice that though the normal school is not undertaking original investigation, it is doing something in sifting out the wheat from the chaff in the grain that comes from other fields. It is encouraging to note that it is conceded to-day[2] that the normal school should do a broader work than it has done in the past; it should aim to originate as well as to test and apply. Even if it accomplishes but little in this direction, yet what it does achieve must in any event be admitted to the rank of scientific knowledge under the same rules that obtain respecting the products of all laboratory research. The need of original investigation in education is recognized in the establishment of a group of institutions designed more particularly as experimental schools, and conducted in such a manner as to

[1] See Report of the Commissioner of Education for 1898–99.

[2] See report of a "Committee on Normal Schools," Add. and Proc. of the N.E.A., 1899, pp. 836 *et seq.*, for a discussion of the field of work for the normal school. Also F. E. Bolton, Original Investigation in Normal Schools, Education, May and June, 1900.

give opportunity for a critical, scientific exploration of unknown or debatable regions in education,—the Practice School at Jena,[1] the Chicago Institute, the Elementary School of the University of Chicago,[2] and the Speyer School, Columbia University. In these schools the phenomena for investigation can be examined directly, at first hand, and conditions can to a considerable extent be varied to meet the necessities for experimental work.

§ 4. The Child-study Movement.

28. Most significant of all the present-day tendencies in the experimental study of education, however, is the Child-study Movement,[3] which is seeking more or less successfully to employ methods of precision in the investigation of the problems of teaching. There is, of course, much difference of opinion regarding the worth of the results which have been attained thus far. On the one side, enthusiastic in praise of the Movement, are such men as Hall,[4] Barnes,[5]

[1] See an article describing it in Add. and Proc. of the N.E.A. for 1896, pp. 644 *et seq.*

[2] See Dewey, The School and Society, pt. 4.

[3] See Report of the Commissioner of Education, 1892–93, Vol. I., chap. 10.; and 1897–98, Vol. II. pp. 1281–1390. See also Wiltse, A Preliminary Sketch of the History of Child-study in America, Pedagogical Seminary, Vol. III., pp. 189–212, and Vol. IV., pp. 111–125.

[4] See the following references: Child-study as a Basis for Psychology and Psychological Teaching, in Report of the Commissioner of Education, 1892–93, Vol. I., pp. 357, 358, 367–370; Child-study the Basis of Exact Education, Forum, Vol. XVI., pp. 429 *et seq.;* Research the Vital Spirit of Teaching, Forum, Vol. XVII., pp. 558 *et seq.*

[5] See numerous articles by Barnes in Studies in Education, ten numbers.

Sully,[1] Buisson,[2] and scores of the best thinkers of our day in matters pertaining to human nature. On the other side, declaring against much of what is done in the name of Child-study, is Münsterberg,[3] and a band of followers. But it will hardly be denied that the majority of men competent to form a judgment regard the investigations upon the development of the child-mind, and the effects of various influences upon it, now being prosecuted with such vigor and enthusiasm, as, in considerable part at any rate, genuinely valuable. Direct observations and statistical investigations are made with something of the exactness and completeness of detail in the field of mental development by such persons as Preyer, Hall, Shinn, Baldwin, and others,[4] that were attained by Darwin in the field of biology, or Newton in physics, or Galileo in astronomy.

29. In much that has been done, without doubt, the wheat and the chaff have been gathered indiscriminately, but this defect is not peculiar to research in education. In every field the corn and weeds grow alongside one another, and at first they may not be readily distinguishable. It is only when the crop is matur-

[1] See Babies and Science, Cornhill Magazine, Vol. XLIII., pp. 539 *et seq.;* also The Child in Recent English Literature, Fortnightly Review, N. S., Vol. LXI. pp. 218 *et seq.;* and the New Study of Children, Fortnightly Review, LVII., pp. 723 *et seq.*

[2] Buisson has recently organized an international society for the scientific study of children.

[3] See his article on Psychology and Education, Educational Review, Vol. XVI., pp. 105 *et seq.*

[4] See Miss Wiltse's Preliminary Sketch, etc., referred to above, for a partial statement of what has already been done in this field.

ing that the true character of the weeds becomes obvious, and they are killed off by the farmer or are choked out by the more lusty growth of the corn. Nature in her own works is never precise, in the sense that she produces only that which is truthful to fact. There is always excess, superabundance; there is the misfit as well as the fit; there is error as well as truth. But in the long run truth, being in accord with the world-order, will survive and error will be crushed out. Whewell[1] and others have shown that in the initial period of every science which is accorded high rank to-day there is nothing but a mass of superstitions, traditions, and a few exact observations; and then the first work of the scientists consists in putting everything to a test which will determine its worth, and in this way to cull out of the heap of stuff what little is valuable, to which additions will gradually be made.

One might truthfully say of Child-study what Pearson says[2] of anthropology and kindred sciences—"Our more thorough classification, however, of the facts of human development, our more accurate knowledge of the early history of human societies, of primitive customs, laws, and religions, our application of the principle of natural selection to man and his communities, are converting anthropology, folk-lore, sociology, and psychology into true sciences. We begin to see indisputable sequences in groups of both mental and social facts. The causes which favor the growth or decay of human societies become more obvious and more the subject of scientific investigation. Mental

[1] In his History of the Inductive Sciences.

[2] *Op. cit.*, p. 16.

and social facts are thus not beyond the range of scientific treatment, but their classification has not been so complete, nor, for obvious reasons, so unprejudiced, as those of physical or biological phenomena."

§ 5. The Evolutionary Point of View.

30. Without doubt the chief reason why men have seen education in such different lights is because they have viewed it from different standpoints. They have brought to the study of the phenomena of human nature different apperception masses, and this has led each to give his own particular interpretation to what has been seen. One who conceives that man was made out of hand for the purpose of self-realization through earthly experience is certain to make what is presented to his sight fit into this picture. He will ignore whatever is out of harmony with it, or fail to detect the real attributes of the thing which he examines. Another man who believes that human life is but a "wail between two abysses of nothingness," will behold the situation marked with peculiar colorings; and if he turn educationist he will form characteristic notions respecting the end and processes of training. Again, one who regards the human organism, both mind and body, as having been developed through a process of adjustment to environing forces will be certain to arrive at conceptions of education quite distinct, in some respects at least, from his fellow-inquirers. We should expect, then, that there would be some such divergence of opinion in respect of details, and perhaps in respect of fundamental principles, as we have found in the teachers of times past. There has been no great organizing principle which

has been maintained by the eminent thinkers of old, no common viewpoint regarding the origin of man's powers, the uses to which they were to be put, and the modes of making them most effective in the attainment of the ends for which they exist.

But is it too much to say that contemporary scientific thought is reaching such a principle, which most men accept, and which makes clear the meaning of life as it is manifested in the world, and so brings order and system out of chaos? Since the publication of Darwin's Origin of Species, indicating how all forms of life have been developed, how they have come into possession of various organic and mental powers, men have grown to feel that we have at last a great law which points out whence man's faculties have come, what is their *raison d'etre*, how they are designed to be employed, and what conditions are essential for the attainment of the highest success in individual and social life. The evolutionary view has come to be taken in every field of biological investigation; and in this view is seen the rationale of much at any rate of the phenomena of human life. As Le Conte has said[1] "the leaven of evolution and the evolution method have leavened the whole lump of human knowledge, especially in all those departments which are too complex to be subdued by other methods. This method is applicable not only to plant and animal life, but also to all the phenomena of human life, individual and social, and therefore to psychology, to language, to history, to sociology, and to ethics. In fact the enormous recent advances in all these are due wholly to the use of the so-called historic method." Some one

[1] Add. and Proc. N.E.A., 1895, pp. 154, 155.

has said that Darwin's great book came just in time to save many of the finest spirits from despair; it gave a point of view in which were harmonized all the varied phenomena of life, and particularly of human life, many of which in any other view appear to be incompatible, antagonistic, inexplicable.

31. As we might expect, this evolutionary principle has rendered great service to education. It has thrown floods of light upon the most fundamental problems with which education is concerned. It has pointed out conclusively, for most men at any rate, that the requisite for successful living is adjustment to the environing world of people and of nature, although the precise significance of adjustment may yet be a matter upon which men are not universally agreed. It has illumined many of the dark places in psychology, showing, not in detail only, but in a large way, for what end the mind of man has been fashioned, of what it is capable, and under what circumstances it will function most effectively. It has presented us with a sketch of the origin of mind and its gradual development throughout racial history, so that we may see what powers have been created from time to time, and to what end.[1]

And if we get grounded properly on these fundamental matters we have a basis for the interpretation of the details which are involved in educational processes. We are placed in just such a situation in this respect as the physicist who demonstrates in his laboratory certain laws, and then uses them for the explanation of phenomena in every part of the universe to which he can gain access, but where experiment is impossible. The

[1] Cf. Le Conte, *op. cit.*, p. 155.

educationist is not less scientific than the physicist, if he proceeds to extend certain great fundamental principles respecting the nature of human life and the manner of its response to environing influences, to the interpretation of details regarding the behavior of mind under educational agencies, including the effects of particular studies and different modes of presenting them, and the purpose and method of discipline in the school.

32. The doctrine of evolution has given a special bent to all biological science, and as much to psychology as to any other branch. Jastrow has pointed out [1] that the modern conception of the mind as a "growth process" and as functioning for the sake of adjustment to a complex environment has cleared up a great many dark places in psychology. We have come to realize that there is a vital connection between the human and the animal mind; and mind everywhere in the universe is connected by bonds of blood relationship. Every phase of human life and achievement viewed from this new standpoint becomes more intelligible; the reason of things becomes more apparent and everywhere there is clearer perception "of the increasing purpose that through the ages runs." The evolutionary mode of looking at mind has led us to see that the individual mind is not a thing apart by itself, but functions with reference to other minds, with reference to the social life about it. The individual mind, as Dewey says,[2] receives its support continually from other minds. It operates through the stimulus which it receives from them. This conception is forced upon us by evolution, which shows us that any individual mind is the product

[1] The Psychological Review, Vol. VIII., pp. 5, 6.

[2] The Elementary School Record, No. 9. p. 223.

of an infinity of ages of effort on the part of the race, and it is developed in an "environment which is social as well as physical, and social needs and aims have been most potent in shaping it."

33. This view of mind as a reacting mechanism has caused educationists to consider it as dynamic instead of static [1] in its behavior; as existing for a purpose; as having been fashioned with reference to the requirements of adaptation to environing conditions. The present-day psychologist regards the mind as a functional organ, a view which the older psychologists rarely gained, and lacking which they were unable to explain satisfactorily the *raison d'etre* and relations of human faculties. One is impressed with this as he sees the struggles of Herbart to co-ordinate the phenomena of mind which he observed in his own consciousness and in the men around him. We feel that he saw many isolated things correctly, but we realize that he could not possibly correlate them properly; he could not get them into a rational system, because he did not take the functional view. He beholds a conflict in the mental life; he sees ideas struggling desperately with one another for supremacy, and he discerns certain rules of the game, certain conditions which determine the combative power of different ideas, but he does not see why there is this warfare. And he must fill out the gaps in his observations from his mathematical field instead of from the biological field, to which the subject he is dealing with properly belongs. So, too, with Hegel; we are told he has studied mind at first

[1] The conception of things as static, fixed, unchanging formerly ruled in every field of thought.—Cf. Le Conte, *op cit*, pp. 155, 156

hand; but he has looked upon ideas as existing for the sake largely of existence, and combining and recombining in various ways, but the reason for this is not found in the needs of adjustment. The whole field of subconscious activity, which evolution makes reasonably clear, was a *terra incognita* to Locke, and led him to devise innate faculties and other things, which, while doubtless accounting in a way for many of the phenomena occurring in daily life, yet carried him far afield in the inferences which were drawn therefrom.

So one might look at the theories of other psychologists and find that the lack of a conception of the mind as a functioning organ, as a medium for the securing of adjustment, resulted in the construction of a more or less fantastic psychology, seeking to explain the phenomena of experience by some metaphysical or religious notion. Only the half of mind was taken into consideration,—the whole active, expressive side was overlooked. "The older psychology was a psychology of knowledge, of intellect," says Dewey.[1] Little heed was paid to the emotional and active parts of one's nature. The psychologists talked continually about sensations, but little was ever heard about movements. People formerly did not conceive that an intellect functioned for the sake of controlling action. If ideas and feelings did exert an influence upon conduct it was an accidental and not an inevitable matter.

34. Now some persons may feel distressed that mind is thus regarded as a means to an end—as a tool, they may say. Unhappily the use of such terms, having been associated with menial things in the physical

[1] The Elementary School Record, No. 9, p. 224.

world, inspire prejudice against real and lofty things in the mental world. The mind of man, as the educationist must deal with it, is truly a tool, if one will think of it in that way; or it is a most wise and trusty guide, counsellor, governor, if one will look at it in another way. And the thought needs repetition that the educationist has to do with man's career in the world in which he is placed. He has to deal with capacities that are capable of modification, of stimulation, of improvement by educational agencies. If there be powers of the human spirit which cannot be affected by such influence, then the educationist as such can have no concern whatever with them. He may as a man entertain whatever belief seems reasonable to him, but as an educator he has no choice whatever but to regard the mind as a reacting organism, taking an active attitude toward all stimulations for the purpose of getting into proper relation with them. The educationist can make no headway if he gives himself up to speculations about an "indeterminate, self-evolving first principle." His function is to bring forces to bear upon a being that will respond to them and be moulded by them. All the talk about a "divine" and "free" and "spiritual" being can do nothing for the teacher if it stops with this. He must know what a human being is on his active, dynamic side, for this is all that he can influence.

This is the conception that is coming to dominate modern educational thought, and its soundness is testified to by the history of mankind. What Davidson has said[1] of the effects upon the conduct of men

[1] Aristotle and the Ancient Educational Ideal, p. 232.

in ancient times of metaphysical speculation could be repeated of mere philosophizing of this sort in all ages in respect of its effect upon the educator. "The sober fact was," he says, "that the contemplation of divine things, which more and more absorbed the energy of Greek thought, was, except for Aristotle, a mere vague aspersion without moral value, and became evermore a sort of mystic ecstasy, in which the individual instead of acquiring insight and power to live worthily and beneficently in the world, was thrown back upon himself with his will paralzyed."

§ 6. The Practical Needs of the Teacher.

35. It remains to be pointed out that this method of viewing education, which is most helpful in the development of the subject on its scientific side, is also most serviceable to the teacher as an artist. We have heard enough in our day to be impressed with the fact that the study of abstract psychology adds little to the effectiveness of the teacher's work. What he stands most in need of is to get *en rapport* with his students; to instinctively feel the direction in which the current of their lives runs. But the "mental science" which has been pursued by candidates for teaching has been about as remote from the real life of the schoolroom as geometry or astronomy or any other subject. A static view of human nature can never throw much light along the instructor's way. But it does not seem unreasonable to say that modern psychology, which shows mind functioning for a purpose, and this to obtain mastery of the environing world,—such study as this will afford the teacher vantage-ground from which to gain an outlook over his field,

and to see the significance of much that is occurring therein. And not only will he see the significance of things, but he will gain some insight into the means of directing them so as to attain the great ends toward which education should move.

Such a treatment of education will not attempt to give the teacher dogmas which can be put into operation on all occasions without modification. It will aim rather to place him at a point of view from which he may discern more clearly the meaning of what he beholds in any individual life with which he is dealing. Certain very general principles, or bases of interpretation perhaps, must hold in all cases; but there will be a special way in which they are exemplified in each individual life. The problems of education presented in this way will enforce upon the teacher the conception that all individuals tend in certain general directions, but they may travel by quite different routes. It will liberalize his regimen in the school, making him less of a dogmatist and more of a naturalist. And we are here at the real gist of the matter. The teacher ought to be a naturalist of a certain high type;[1] he ought to be a student of the lives under his care, bringing to his study those general conceptions which are truthful to the nature of mind in the large view, and aiming to see their application in special ways in individual instances. If he can come to look upon the children before him as inheritors of the accumulated wisdom of

[1] Cf. Royce, Is there a Science of Education? Educational Review, Vol. I., pp. 15–25 and 121–132. Also articles by the writer as follows: Teachers by the Grace of God, Journal of Pedagogy, Vol. XIII., No. 1; The University Study of Education, The School Review, Vol. VIII., pp. 157–181; Concerning High-school Teachers, School Review, Vol. X., pp. 778–795.

racial experience in the effort to get adjusted to the environment; if he can further regard them as struggling unceasingly on their own part to learn the world, and adapt themselves to it; and if he can in addition work his way through some of the detailed processes which are involved in the attainment of this end, he will have made the best preparation he can for the discharge of his duties.

36. But there will doubtless be some who will maintain that this leaves the teacher too much in the air; that such a treatment of education is too thoroughgoing; that it makes the subject too complex for his comprehension. It has been said over and over again by pedagogues, more earnest it is to be feared than wise, that what the teacher needs is a few simple formulas; and this theory has been duly recognized in the books that have been prepared for the teacher. Most of the volumes on pedagogy that have been made in our country in the last seventy-five years show how men have tried to state the involved, intricate principles of education in brief, universal dogmas, which, as they have thought, could be quickly and easily memorized by the teacher, who has little time for study and slight capacity for the comprehension of difficult things. Nowhere apparently has formalism been more evident than in the training of the teacher. The normal schools have in the past been great dispensaries of formalism; they have taught rules rather than human nature; they have tried to make the teacher a shopman instead of a naturalist. Now an attempt to present a complex field of thought and action in simple dogmas must result in formalism; and while memorizing of this sort of thing may do for

the tyro, who would have it appear that he possesses knowledge, still it makes a very poor equipment for one who must grapple with real situations in the schoolroom.

Would it not be far better to leave the teacher in his native condition of mind, depending upon his tact and instinct to guide him aright in schoolroom situations, than to force upon him dogmatic propositions that are certain to lead him astray if he endeavors to push them out into action. Payne[1] puts the matter in the right light when he says that "we incur a grave danger when we impose on a teacher a specific rule for action divorced from the principle that is its justification. Contrasted with a principle, a rule is undiscriminating, narrowing, unfruitful; and it must be confessed that systematic training in method has a tendency to rob the teacher of his freedom, his versatility, and his personal power. Method has an incomparable value when it directs capitalized energy, wisdom, and culture; but method is taught at some sacrifice of scholarship and culture when it accompanies a teacher's instruction in subjects, and is made a characteristic element in his course of study."

37. And finally, if it be said that what the teacher needs is not principles but something "immediately practical," then it may be replied that no such thing can be secured in any important sense. The things which are to be made immediately practical are only too likely to be grossly dogmatical, formal, and untrue in many situations. The practical thing is the truthful thing always; and the truthful thing is never, in edu-

[1] Contributions to the Science of Education, p. viii.

cation, a body of simple dogmas that can be learned by heart, and that can have universal validity. There is only one sort of thing which is genuinely practical for the teacher, and that is the spirit and method of the naturalist in the highest sense, and as complete a knowledge of human nature as can be obtained. Any course that attempts to run across lots will pass by the only objects of value in the preparation of the teacher. When the destination is reached by a short-cut route the traveller will find that he has no experience which will make the phenomena that present themselves in his new quarters intelligible.

And further, one will not be accused of dogmatism when he asserts that the teaching profession ought to acquire a much greater appreciation of truth for its own sake, without regard to what is called its immediate practical application, than it has manifested heretofore. Truth pursued for its own sake will always lead to beneficial results; but sought after merely for some practical end it is often never attained and the end is never reached. In the words of Comte[1] "the most important practical results continually flow from theories formed purely with scientific intent, and which have sometimes been pursued for ages without any practical result. A remarkable example is furnished by the beautiful researches of the Greek geometers upon conic sections, which, after a long series of generations, have renovated the science of astronomy, and thus brought the art of navigation to a pitch of perfection which it could never have reached but for the purely theoretic inquiries of Archimedes and

[1] Quoted by Fiske, Cosmical Evolution, I., p. 252.

Apollonius. As Condorcet well observes, the sailor, whom an exact calculation of longitude preserves from shipwreck, owes his life to a theory conceived, two thousand years ago, by men of genius who were thinking of nothing but lines and angles."

PART II.

THE MEANING AND AIM OF EDUCATION.

CHAPTER IV.

THE AIM OF EDUCATION—SOME COMMON VIEWS.

§ 1. The Agencies Concerned in Education.

38. In an older day the term Education commonly denoted the effects produced in the minds and morals of the young by the instruction and discipline of the school alone. Men did not regard the influences outside of the classroom as educative in the true sense, for these were not thought to equip a person in any way for the serious work of the world, or to model his character after a suitable pattern.

But in these times it seems to be generally believed that in the broadest view all phases of the environment that act upon the child, and that set up any manner of response in him, contribute to establish his course in life, and so are truly educational for him. And still, looked at from one standpoint, education may not inappropriately be regarded as confined to the work of the school, for no other institution is maintained for the sole purpose of training the young. The home has other duties to discharge; its efforts

must be directed largely toward providing for the physical well-being of its members—toward securing food, clothing, and shelter. It cannot to any great extent in the present social order plan its organization and marshal its forces with an eye single to the educational needs of the children. Financial and other demands draw heavily upon its resources, and what it does for the child's education is fortuitous, or accessory, though happily this is not without value.

Again, the street cannot properly be called an educational agency. The training to be had from it must really be acquired in spite of it, or at least with indifference on its part. It presents to the learner of life's ways just the situations and conditions which are most favorable to the carrying forward of commercial enterprises. It takes no thought whatever of the pupil who is absorbing its lessons, such as they are. If he can profit by them, and is not in the way, he is welcome to all he can get from them; if he cannot, why then the street must not be censured, for its mission is of another sort.

Still again, the boy in the give-and-take experiences with his fellows on the playground has developed in him those traits, and only those, that advance the temporary interests of the group to which he belongs. He acquires nothing more than is necessary to be learned in order that he may get on here and now with this particular set, and the learning may of course be good or bad according to the quality of the group. The adaptations he makes, while they are of immediate service, may be detrimental to him in later life. His companions do not have his future welfare in mind, only their own present pleasure. True, what is thus

gained is often, it may be usually, of inestimable service in the fitting of the child for right living with his fellows in maturity. Still the discipline is incidental; it is never adequate to the needs of even the lowest and simplest forms of social life, and it terminates early in the career of the majority of children, long before the process of maturing is complete.

39. But it is different with the school. Its resources are devoted fully and of set purpose to the sole end of amplifying and directing the child's thought, and fashioning his character. All its appointments, all its mechanics, all its energies, are planned with the child's present needs and capacities and future well-being in view. The school is, then, *par excellence*, the instrument of education in modern society.

40. Among peoples who have not evolved beyond the simplest stages of adjustment to their physical environment, whose community life is primitive, and who have no records in written language of their achievements in the sciences and the arts,—among such no school is needed, for the child can pick up by informal daily intercourse with his elders all that could be taught him by any member of the group. If there happen to be some subtleties relating to religious belief and worship, or to the recognition of the special rights of favored persons in the tribe, these can be impressed in a few lessons at the parent's knee before the child emerges into manhood or womanhood.

41. But what a different course the child born among civilized men has before him. What realms of knowledge he must explore, and what powers he must acquire that he may support himself according to the standards of civilization, and that he may dwell in the spirit of

brotherly love with his fellow-man! Everything has become so complex with us, and there are so many subtle and intricate arts to be mastered, if one is to keep in the race at all, that training cannot be left to chance. The child must give himself to the business of learning almost from the very beginning, and must keep steadily at it until he is called upon to play his own part in the social drama. So the school becomes an absolute necessity, having to do for the child what the home and the street and the playground cannot do for him. But still it must be recognized, and this is essential for a right view of either the curriculum, the character of discipline, or the method of teaching, that the training of the school does not differ in principle from that of outside instrumentalities. The real distinction lies in the degree to which it systematizes educational agencies, the deliberation and single-mindedness with which it proceeds in its work, and the thoroughness with which it concentrates its forces upon the developing child.[1]

§ 2. The Aim of the School.

42. So, narrowing our view down to the school, we need to inquire as to the goal which it has or ought to have clearly in view. The studies we will cause the

[1] So we would say with Bain that "in the widest sense of the word a man is *educated*, either for good or evil, by everything that he experiences from the cradle to the grave. But in the more limited and usual sense the term education is confined to the efforts made, of set purpose, to train men in a particular way—the efforts of the grown-up part of the community to inform the intellect and mould the character of the young; and more especially to the labors of professional educators or schoolmasters."—*Education as a Science*, p. 3.

learner to master, and the manner in which we will present them to him, must, of course, be determined by this goal. Now, when we ask the people we meet on the street and in the drawing-room what they regard as the aim of education—for what purpose they support the school—we find that opinions are about as numerous as are the people who offer them. The man of affairs will tell you that the school "should equip the pupil with the means of getting on in life; of earning his daily bread." Try another man, who is not so much concerned with industry and money, and you will be started on a different track. For him the school may exist to "train the mind," to "discipline the faculties," to "make perception and memory and reason keen and accurate and faithful." Still another will assure you that the end to be aimed at in all education is "culture." The school must seek to develop in one gentle, refined thought and feeling. It must give him grace in speech and manner, so as to make his intercourse with others tolerable. Or again, it is the business of the school to "mould the character of the young," to make them honest and just and temperate and truthful, and pure in mind and action. And then one will hear often enough that the school should strive to make man a "harmonious being" by awakening and nourishing all his powers—physical, mental, and moral; that it should lead him to "participate in the life and accomplishments of the race"; that it should prepare him for "complete living"; that it should afford him an opportunity to acquire learning;—and so one might go on at great length without exhausting the various answers to the question, What should be the aim of the school?

43. And when one looks up the views of the great men of the past who were the oracles of their times, and who have left us their opinions on education, he will discover some such diversity of belief as exists in the public mind to-day. Plato maintains[1] that it must fashion the life of the individual in an all-round manner; that it must nurture every inherent potency, bringing all his faculties into a harmoniously developed whole; that it must "give to the body and to the soul all the beauty and all the perfection of which they are capable." Education must call into active being faculties native to every mind. There exist in embryo, or perhaps rather *in potentia*, in the human spirit ideal attributes, for which education must provide the opportunity to attain complete unfoldment. The purpose of all study and training is to bring the soul up out of the cave of ignorance, where only shadows of real things are perceived, into the open day, where it may behold the true light. And the training must proceed without reference to anything the individual will be called upon to do in the work-a-day world in which he is condemned to live his physical, though not his spiritual life. The child should not be allowed to think of practical matters, for this debases the spirit; "practical arts are degenerating." He must keep his eyes turned

[1] See the Republic (Davies and Vaughn) 502 (referring to the paging of the original Stephanus edition) to end of Book VII. See also 377 to 412, sections treating of the stories to be told to his "Guardians," the form in which the stories are to be told, the songs, harmonies, and musical instruments to be permitted in his ideal republic, and the physical education of the Guardians. Bryan's Plato as Teacher gives the parts of the Republic bearing directly upon teaching.

upward toward "real existence" and strive ever to attain unto pure truth and self-completeness.

Certain aspects of this view have been frequently endorsed, in the form of statement at any rate, in modern times. The founders of the Prussian National System, for instance, speaking through the great Stein, state as the end of education "the harmonious and equable evolution of the human powers, by a method based on the nature of the mind, every power of the soul to be unfolded, every crude principle of life stirred up and nourished." [1]

44. Question Aristotle and he will say [2] that education should help each individual to attain the highest degree of happiness by living a virtuous life as a citizen of a virtuous state. Virtue is the end of all educational endeavor; but this virtue has reference to the things of daily life, to one's duties toward his fellows, to his treatment of himself;—in brief it is *practical* virtue. Aristotle's conception of education may be appreciated best when contrasted with that of Plato. If we make the comparison, as Laurie does,[3] "we are struck by the modern spirit of Aristotle. The cultured and harmonious man is not an object of concern with him but only the capable and virtuous citizen. Let each man be sound in body and virtuous, and Aristotle is content. He demands, however, that he be capable also of enjoyment and that he shall enjoy."

45. Coming down to more recent times we find Locke

[1] Donaldson, Lectures on Education, p. 38. (Quoted by Bain, Education as a Science, p. 1.)

[2] See Politics, Book VII., chap. 17 to end of Book VIII., Jowett's Translation.

[3] An Historical Survey of Pre-Christian Education, p. 318.

declaring that "'tis Virtue, then, direct *Virtue*, which is the hard and valuable part to be aimed at in Education. . . . This is the solid and substantial Good which Tutors should not only read Lectures and talk of, but the Labour and Art of Education should furnish the Mind with, and fasten there, and never cease till the young Man has a true Relish of it, and plac'd his Strength, his Glory, and his Pleasure in it."[1] And Locke's virtue is, like Aristotle's, practical in character. Mere goodness is not what he wants, but a knowledge of the world, and the capacity to deal effectively with it. This is Rousseau's view of the matter, too, in its essential features. He would consult nature to ascertain what she designed the child to become, and then he would strive to achieve this in his education, to the end that the individual might be at peace with himself and the world when he reached maturity. For Rousseau nature and not nurture, the woods and not the Academy, will best supply the conditions for the healthy evolution of the child's soul. According to Herbart,[2] education should aim at the development of a symmetrical character, one in which there will be ready and sympathetic response to the varied interests which should receive one's attention. And when we come to Spencer, if we may here mention one so modern, we get the first glimpse of what one might call the biological view of education,—the view that an individual's well-being is at all times conditioned by the forces operating in

[1] Thoughts on Education, sec. 70.

[2] See his Science of Education, etc., translated by H. M. and Emmie Felkin. Also Herbart and the Herbartians, edited by De Garmo, and Outlines of Educational Doctrine, translated by Lange.

his environment, and education must prepare him to put himself *en rapport* with these, and to turn them to profitable account.

§ 3. The Doctrine of Unfoldment.

46. In the midst of much seemingly great diversity of opinion [1] there is in reality considerable uniformity. There are what for practical purposes one might call *types of aims*, which differ from one another according as they are founded upon different conceptions of human nature. One of these conceptions, which has been the source of a large body of educational doctrine variously stated by various writers but much the same in substance, regards man on his spiritual side as an entity set apart from everything else in the universe, and possessing powers and attributes which find their *raison d'etre* in simple existence as ends in themselves. This is Plato's conception, as we have seen. The mind is anchored temporarily in a physical world, but it is not a part of things material. It comes to perfection by reacting upon the world, but it has not been given to man for the purpose of his employing it in adjusting himself to the world. According to this view the mind of the child must be unfolded so that all its faculties may be spread out to the light, as the bud should be brought to flower, in order that the purpose of its creation may be fully realized. "Life," says Hailmann,[2] in developing the purpose of education,

[1] See Putnam, A Manual of Pedagogics, pp. 13 *et seq.*, for many diverse statements of the purpose of education, in addition to those given above.

[2] Add. and Proc. N.E.A., 1899, p. 584. See also Davidson, Education as World-building, Educational Review, 1900. By

"is a process of self-realization, the innermost essence of life is the instinct of self-expansion. Life is a process of becoming, a continuous growing toward what may lie more or less vaguely concealed in the depths of instinct, or stand revealed more or less clearly in the ideal of self-conscious will."

People who see the child in this light fix their gaze on the spiritual heights which they feel he is destined to attain, rather than on the child himself, as he works his way slowly from a state of helplessness to a point where he can maintain his existence by right adjustment to the forces which play upon him, and with which he *must* come into a certain kind of correspondence if he would survive in the struggle for life. Such persons cannot bring themselves to regard the mind as given to man to enable him to attain the greatest amount of pleasure and reduce pain to the minimum in the world in which he is placed. They consider this to be an ignoble conception of the human mind. So they arrive at the conclusion that the purpose of education is to afford opportunity for the expansion, as it were, of those ideal attributes which are possessed in embryo at the start, or to supply the conditions by which they may become "realized." This is the conception running through all the educational writing of Froebel[1] and

"world-building" the author often seems to mean the evolution of the internal world without special reference to what is external; but in the following quotation he has the environing social world in view: "The aim of education is, as we have seen, world-building, the construction in the child's consciousness of such a world as shall furnish him with motives to live an enlightened, kindly, helpful, and noble social life."—Davidson, *A History of Education*, p. 257.

[1] See his Education of Man, and Education by Development

his disciples, as well as Hegel,[1] and many another educator of a philosophical turn of mind. In strict logic it makes little difference what materials the schools employ for this purpose, or how they proceed, only so that they attain the supreme end, the unfolding of the faculties of the soul. Browning expresses this conception when he makes Paracelsus say:

> "Truth is within ourselves; it takes no rise
> From outward things, whate'er you may believe.
> There is an inmost centre in us all,
> Where truth abides in fullness; and around,
> Wall upon wall, the gross flesh hems it in,
> This perfect, clear conception. . . .
> . . . And, to know,
> Rather consists in opening out a way
> Whence the imprisoned splendor may escape,
> Than in effecting entry for a light
> Supposed to be without."

47. This view regards all powers of the physical and all attributes of the spiritual being as existing in and for themselves, and for no ulterior end. Strength and symmetry and grace of body should not be striven after or developed by education for any practical purpose. Beauty should indeed be sought after, but for its own sake, and so with every other desirable quality. Likewise reason and hope and reverence and love, and all intellectual and emotional properties of the soul must be aroused and nourished by the school only for their inherent, self-referring value. Every-

(both translated and published in the International Education Series). Most of the literature relating to the kindergarten is full of the Froebelian philosophy of unfolding innate faculties through the discipline of education.

[1] See Luqueer, Hegel as Educator.

thing is inner and self-relating in this doctrine that may, perhaps, be called the doctrine of Unfoldment. Studies and methods must be selected with reference to their suitability to *exercise* mental faculty, and so bring it to perfection without regard to the manner in which the energies of the individual will be expended in the practical, concrete life of maturity. What we must do is to "nourish the mind of the child through the course of study . . ., and to provide the opportunity for the exercise of all his powers, mental, moral, æsthetic, manual, or constructive, through good instruction and wise discipline."[1] Professor Hanus thus states his view of the aim of education, but he proceeds at once to work out a scale of values based on the aim of bringing the individual into most intimate correspondence with his environments, and of giving him a mastery of the forces which condition his well-being.

48. It is without doubt true that most of those whose faith rests in the doctrine of Unfoldment as the chief end of educational effort anticipate that the results of a system of training based thereupon would be of some practical avail. Every advocate of Unfoldment, except Plato possibly, would doubtless admit that as long as man dwells here below he is subject to physical needs and appetites and limitations, and must maintain himself in constant relation to his fellows who have needs and appetites and limitations of the same sort as his own; and further, he is furnished with a mind which is everlastingly curious to ascertain how things that environ it are

[1] Hanus, Educational Aims and Educational Values, p. 17.

put together, and how they work, and by virtue of what causes and to what end proceed the forces which incessantly play upon him and stimulate him to some sort of action. And education ought to aid him to deal wisely with the problems which arise out of these situations, either by showing him how to solve them or to put them out of his attention. So, as a matter of fact, self-realization does not really ignore absolutely the real, concrete side of life. Reason brought to fruition will give the pupil insight into the constitution of things; it will point out a way for him to go in order that his journey may be most comfortable and successful. The soul, self-realized on the side of honesty, will be the better prepared to fit in harmoniously to the social mechanism. So every power of the self-realized soul must play some part in adjusting its possessor to the world about him. But still the outcome of Unfoldment as a guide to the teacher in the management and instruction of the school is not likely to be the same as if he had aimed directly at equipping the child for the exigencies of his daily life.

§ 4. The Doctrine of Formal Discipline.

49. Of all the aims of education that have been entertained from the earliest times that of Formal Discipline has probably been the most conspicuous. Men holding to the view that the human mind contains in embryo from the very beginning the full measure of intellectual and emotional faculties,[1] have declared

[1] "According to the older view mind was mind, and that was the whole story. Mind was the same throughout, because fitted out with the same assortment of faculties whether in child or adult. If any difference was made it was simply that

that in the school these must be stimulated, trained—*disciplined*[1] is the word—not for the purpose of unfolding precisely, but in order to develop power and efficiency. If in the school memory be exercised vigorously upon one kind of material or another—it really makes little difference what it may be—then in after years the mnemonic power thus acquired in childhood days may be put to good account as emergencies may require. So Morgan argues[2] that education should afford suitable conditions for the gaining of sense-experiences and the correlation of sense-data. And to what end? That the child may be fitted to "deal practically and effectually with his natural environment." But should these sense-experiences relate to the natural environment, or is this immaterial? This

some of these ready-made faculties—such as memory—came into play at an earlier time, while others, such as judging and inferring, made their appearance only after the child, through memorizing drills, had been reduced to complete dependence upon the thoughts of others. The only improvement that was recognized was one of quantity, of amount. The boy was a little man and his mind was a little mind—in everything but size the same as that of the adult, having its own ready-furnished equipment of faculties of attention, memory, etc."—Dewey, *The Elementary School Record*, No. 9, p. 225.

[1] See Tate, Philosophy of Education, who talks continually about "disciplining the faculties" in education. He represents a large body of pedagogical writers. Among the latest professional books written from this standpoint is Dexter and Garlick's Psychology in the Schoolroom, where one reads about training by formal discipline the powers of observation (pp. 91, 92), memory (p. 132), etc. See also Barnet, Common Sense in Education, and the Report of the Committee of Ten, where the value of a study is often said to depend upon its adaptability for formal training.

[2] Psychology for Teachers, pp. 223, 224.

is the vital question, and the disciplinarian answers it by saying that it is *exercise* of the remembering faculty that is needed, and it makes little difference what is employed for this purpose.

Then again the school must aid in the "development of the perceptive and rational faculties, and the correlative powers of apprehension and description and of comprehension and explanation"; and this must be accomplished by formal training so as to develop a general power which may be called upon for service later.[1] If one can get his pupil to observe anything through any sense in the school, and if he can keep him at it long enough, there will be developed in him a power

[1] Morgan has on other occasions spoken more pointedly of education as having to do with directing one's reactions upon the world instead of disciplining mental faculty in a formal way. Witness the following: "Aristotle saw this long ago. 'The end of our study is not knowledge,' he said, 'but conduct.' And it is no less true to-day than it was then, that the acquisition of knowledge is the means, but the right conduct of life is the end. Leviathan Hobbes emphasized it when he wrote, 'The scope of all speculation is the performance of some action or thing to be done.' Compte summed it up in an epigram: 'We gain knowledge in order to predict, and we predict in order to provide'; or, far more pithily in the original French, '*Savoir pour prevoir, afin de pourvoir.*' Our own great Huxley insists upon it. 'Knowledge of every kind,' he says, 'is useful in proportion as it tends to give people right ideas, which are essential to the foundation of right practice, and to remove wrong ideas, which are no less essential foundations and fertile mothers of errors in practice.' Even thought itself must be active, as Clifford maintained in his panegyric on Whewell of his Cambridge days. 'Thought is powerless,' he said, 'except it make something outside of itself; the thought which conquers the world is not contemplative but active.'"—*The Springs of Conduct*, p. 214.

or habit or tendency or capacity, or whatever it should be called, that may in maturity be applied to the perceiving of anything and everything,—linguistics, mathematics, science, law, theology, or what not. The principle is illustrated especially well in the formal training of reason. If the teacher will stimulate his pupil to work through all the problems in the arithmetic, and parse all the words and diagram all the sentences in the grammar, he will by such exercise generate in him ability to penetrate into the heart of whatever he attacks. Pinning their faith to these dogmas, men "insist upon regarding college studies as disciplines by means of which these habits and dexterities, mental and physical, may be formed, or, in popular terms, by which these powers may be developed and strengthened. This ideal is pushed so far at times that it seems to imply the possibility of developing power as a sort of abstract energy to be stored up and available at will. It might also be inferred that power to do one thing can be easily drafted off for the performance of a very different task." [1]

According to this conception mind is so constituted that it can take any item of experience and use it for full value on every occasion without regard to the time, place, circumstances, or conditions under which it was gained. Mind receives impressions and makes such use and disposition of them as it may at any time will to do. It is not limited in present or future action to what it has done in the past; special exercise begets general power; good reasoning in cube root will give skill in reasoning in everything. Mind is self-contained,

[1] Vincent, The Social Mind and Education, p. 118.

self-regulated, acting according to principles of its own without regard to the environments in which it is born and bred, as it were. It can take particular experiences and use them in a general way in all kinds of situations.[1]

§ 5. The Doctrine of Acquisition.

50. If one should say that Plato and John Sturm constructed their theories of education upon similar fundamental principles he would probably awaken doubts in the minds of most teachers; but nevertheless their conceptions of the human mind seem to be based upon much the same general view. These philosophers both regarded it as a thing apart from the world in popular phraseology; and while it gains in strength and appreciativeness by reacting upon this world, yet this reacting, this learning, one might say, looks toward the good of the individual in a spiritual rather than in a practical way. Sturm's application of this conception to the educational process led him, as it did his contemporaries, and many since his day, to lay chief emphasis upon the acquisition of knowledge as the supreme end of education.[2] Learning develops native faculties, makes active innate potencies, frees the mind; in short it constitutes the *via trita, via tuta* to noble, self-realized manhood and womanhood. How much do you know? is the shibboleth of the Sturmians; not What can you do? or How does your learning enable you to adjust yourself more intimately and

[1] This theory is examined in detail in Chapters XV. and XVI.

[2] See the article on Sturm in Schmid's Encyclopædia. There is a *résumé* of the opinions of his day in Quick, Educational Reformers, pp. 27 *et seq.*

broadly to the world? This is what might be called the doctrine of Acquisition, which has played so prominent a part in determining curricula and methods. It has enthroned knowledge-getting, and has evaluated studies and modes of presenting them according as they are adapted to attain this end. Dewey tells us,[1] referring to the workings of this aim, that in the schools of the past knowledge for its own sake became a thing of primary value. Great emphasis was laid upon the acquisition of abstract ideas and generalizations. Verbal formulæ constituted the principle things in the curriculum. On the other side, protesting against such formal training, were the advocates of sense-training; they wanted pupils to have contact with things, so they introduced object lessons into the school course. But neither side attached any importance to connecting the training of the school with the practical affairs of life.

§ 6. The Doctrine of Utility.

51. Regarded in its simplest aspect (the only one many people can discern) the *summum bonum* of life consists in the earning of one's daily bread with the least effort and pain. One's happiness is dependent upon his skill in doing this, it is often said. The purpose of one's education, then, will to be make him a more ready and successful laborer; to give him deftness and power to win from nature and from man the necessary means for his subsistence. Education viewed in this light appears "brutally utilitarian." Indeed, all that goes on in the schoolroom is intended to make the

[1] The Elementary School Record, No. 9, p. 224.

individual ever more efficient as an instrument in dealing with material things, to make him a better machine that he may advance his own physical well-being and possibly that of others who depend upon his labor. Downright *material* utility is the aim of education based on this view of human life. There are no pains and pleasures of the mind as there are of the body. If one is well fed and clothed and housed he will be happy whether or not he understands the world about him. It is of no great consequence either whether or not he is surrounded by things æsthetic; the pains occasioned by an ugly environment are trivial when compared with the bodily pains which come from not having enough to eat, for instance. Such is the view of the *crass* utilitarians; they cannot see that one bears any vital relations to his environments but those of a material character.

CHAPTER V.

THE AIM SUGGESTED BY MODERN SCIENCE.

§ 1. The Modern Conception of the Nature of Life.

52. It is a commonplace fact that the rapid development during the past half century of the biological sciences has given us data for a philosophy of life in general which is, in its bearings upon human life, suggestive to the student of education. Biologists seem to be agreed in the view that every living thing, no matter where it is found in the scale of life, is such because it possesses the capacity, differing of course in different species, to adapt itself to the environment in which it is placed. It is conditioned by all the forces which act upon it, and the degree of its ability to adjust itself to them determines whether it will survive or perish, whether it will have a vigorous, buoyant, effective life, or simply keep from being destroyed. Life implies the power and *necessity* of adaptation. The forms of life found in the sea, while they are fashioned on certain general plans seen in the modelling of all life, yet differ in details from the life of the land, and the life of the air is different from both, these differences finding their explanation in the needs of the different species for adjustment to the peculiar environments in which they are placed. It is probable that, with

rare exceptions at the most, the minutest detail of construction of an organism has been selected because of its service in helping its possessor to live more perfectly in this sense of adjustment. It was this consideration of serviceableness which led to the preservation of the hand, and the eye, and the ear, and the upright position of the human body, and indeed every member and attribute of the organism. Each had to demonstrate its usefulness in supplying some need better than other devices previously tested would do. The most fundamental things in the body—the circulatory system, the digestive system, the respiratory system, the eliminative system, the marvellously complex nervous system—all illustrate in the minutest detail this great plan, to make an organism that would be fitted to endure in a world of gravitation and changing temperatures, of hunger and thirst, and all the rest.

53. Nor is this all; permanent tenure of office is not assured to any member merely by its selection in the course of evolution. If it grows lethargic in its usefulness it is cast aside. We all know that organs which lie idle speedily atrophy.[1] The price of development and permanency is *use*. Tie up the arm and the biceps will degenerate; bandage the eye and it will sooner or later lose its cunning. Even the brain unused forgets its art,[2] and the same is true of the lungs, the stomach, and every organ. And the activity of a member must be of the sort needed for the welfare of the organism; mere *formal* exercise is not enough.

[1] See e.g., Sutton, Evolution and Disease.

[2] The investigations made by Donaldson on Laura Bridgman's brain show that unused areas became atrophied. See Amer. Journ. of Psych., Vols. III. and IV.

Muscles grow by the performance of deeds which minister to the individual's welfare. Eyes and ears grow keen through seeing and hearing things that have some meaning for the organism. But this does not imply that the blacksmith, for instance, cannot train his muscles in any other way than by hammering at his anvil, or that he does not need anything but strong biceps. He is a man first and a blacksmith afterwards. He has relations toward other things than the horses to be shod and the wagons to be tired, and he must become adapted to these other things if he would attain complete adjustment.

If you don't go forward you are left behind.

2. The Aim Suggested by Neurology.

54. The conception developed above reveals a human being as active, dynamic; it implies that the business of an individual during his earthly career is to get properly related to the world—religious, social, and physical—of which he is an integral part.[1] If this be a sound conception we should expect to see its truth illustrated in the architecture, so to speak, of the organism. The plan of construction ought to show that man was designed for a *relational* life, and as a matter of fact it does reveal such a design. To begin with, modern neurology maintains that mental activity cannot be manifested in this physical world except it operate through a material organism, the brain.[2] "Every psychosis is accompanied by a neu-

[1] Cf. Locke's statement in his Essay on Study: Quick, Locke on Education, p. 196.

[2] See, for instance, Ziehen, Introduction to the Study of Physiological Psychology, translated by Van Liew and Beyer, chaps. 4, 5, 6, 8, 9, 10; Ladd, Outlines of Physiological Psy-

rosis" is one of the commonest of scientific expressions in these times.[1] And we should expect that the plan of construction of the tool would indicate the uses to which it was expected to be, and is capable of being, put. The possibilities, if we can discover them, in the field of neuroses must reveal, in a general way, the possibilities in the field of psychoses, although one may not dogmatize on this topic in the present state of our knowledge. That there may be psychical processes, or perhaps *products*, different from or more complex than those which always awaken or are awakened by neural processes is possible if not probable, as physiologists like Ziehen [2] believe. There may be synthetic activity in the mental life having no exact correlate in nervous action. But however this may be, it seems certain that in the large the sphere

chology, chaps. 19, 20, especially p. 470; Donaldson, Growth of the Brain, chap. 18.

[1] The thought embodied in this phrase can be found running through much of the philosophical and psychological writing of the last half century at any rate. See the following, for example: Lotze, Microcosmus; Darwin, Descent of Man; Romanes, Mental Evolution in Man; Wallace, Darwinism; Fiske, Destiny of Man in the Light of His Origin; Wundt, Human and Animal Psychology, pp. 5–7 and 440–445; James, The Will to Believe and Other Essays, Essay on Reflex Action and Theism.

I have summarized in my Aspects of Mental Economy, chaps. 1 and 9 the results of recent experiment relating to the effects of mental activity on cerebral action, which indicate that thought and feeling are always accompanied by neural action, as shown in increased cerebral circulation and temperature, and in other measurable ways.

[2] *Op. cit.*, p. 2 and chap. 14. See also Ladd, *op. cit.*, chap. 20, and Wundt, *op. cit.*, p. 448.

and purpose of mental action are denoted by the plan of the neural mechanism through which it is carried on.

55. The plan of construction,[1] then, provides, in the first place, for mechanisms to receive data from the external world—the sensory nervous system, comprising the ingoing nerves and the cerebral centres to which they lead; and in the second place it provides for mechanisms to set the organism into action—the motor nervous system, comprising the outgoing nerves and the cerebral centres from which they lead. The parts of these mechanisms of chief interest to us are the cerebral centres, in respect alike of the specific function each discharges, and of their relation to one another in supporting the life of the organism. Fig. 1 shows the sensory centres grouped round the motor centres, to which they are so intimately related that when the former are stimulated the effect is transmitted through connecting fibres to the latter, which in turn institute motor activities appropriate to the occasion. It should be said in passing that some neurologists maintain that every nerve-cell is both sensory and motor in its action; but whichever view is correct the psychological inference would be the same in either case—the teleology of mental action being the reaction in some advantageous manner upon data received from the world environing and affecting the well-being of the individual. Fig. 2 shows the plan of construction of a nerve-cell, indicating plainly that it is designed to receive impressions

[1] See Flechsig, Ueber die Localization der geistigen Vorgänge (Leipzig, 1896), and Gehirn und Seele, for the latest statement; also Barker, The Nervous System (New York, 1900), and Donaldson, *op. cit.*

and to convey messages to the motor mechanisms, either directly or through the motor centres. Now, is it too much to say that Nature has designed that

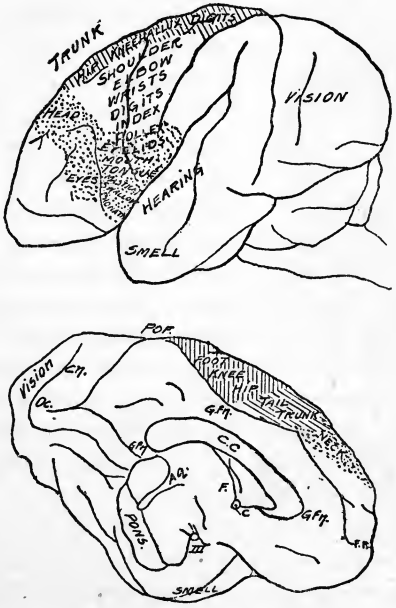

FIG. 1.—Brain of the Macaque monkey, showing the sensory and motor areas. In the sensory region the name of the sensation is over the locality most closely associated with the corresponding sense-organ. In the motor region the name of the part is written over the portion of the cortex which controls it. The uppermost figure gives a lateral view of the hemisphere, and the lowest a mesal view. (From Donaldson's Growth of the Brain.)

when data are reported to us from the world we should respond in some suitable activity? As James has said,[1] the neural organism is, physiologically considered, just a machine for producing reactions upon stimuli;

[1] Psychology, p. 370.

and the intellectual part of one's being constitutes the middle or central term of the machine's operations.

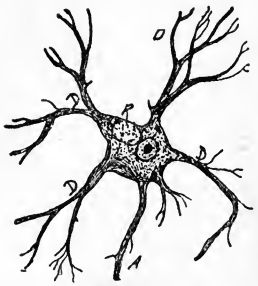

FIG. 2.—Isolated body of a large cell from the ventral horn of the spinal cord. Human × 200 diameters. (Obersteiner.) *A*, neuron; *D*, dendrons; *N*, nucleus with enclosures; *P*, pigment spot. (From Donaldson's Growth of the Brain.)

56. In young children it is seen that every impression of whatever sort which appears to have the slightest meaning for the organism is reacted upon immediately in some manner. Most of us have noticed this in a way; but its significance has been impressed upon our attention by the investigations of Preyer, Perez, Shinn, Hall, Baldwin, and others.[1] At first the character of this action is determined by instinct, but as the child grows older and experiences accumulate, when he has acquired a body of memories deposited, to use Ziehen's term, as a result of his own contact with the world, then the behavior of the moment in response to a given stimulus is regulated in view of the outcome of previous actions in similar situations. Experience thus serves as a guide in encouraging or restraining present action; and this is what we would expect when we take into account the intricacy of the cerebral labyrinth (see Fig. 3). We find that any individual cell is related in a most involved manner to a vast number of other cells, so that it cannot act on its

[1] See, for instance, Burk, Pedagogical Seminary, Vol. VI., No. 1, pp. 5–65; Curtis, Inhibition, Pedagogical Seminary, Vol. VI., No. 1; Oppenheim, The Development of the Child, chap. 5.

own motion in a hasty or independent fashion. Any instructions which it sends out must pass through many hands before they reach their destination, and the purport of the messages gets modified at every point in their transmission so that they finally express the combined wisdom of all. This power of qualifying or inhibiting any given impulse to action may be developed to such a degree in a mature brain that impressions often seem never to issue in conduct. It appears in such cases as if action is incited wholly from within, and not in response to promptings from without; and this leads many to think that conduct is the outworking simply of the self, having for its end self-revelation, self-completion, and not correlation with the world.

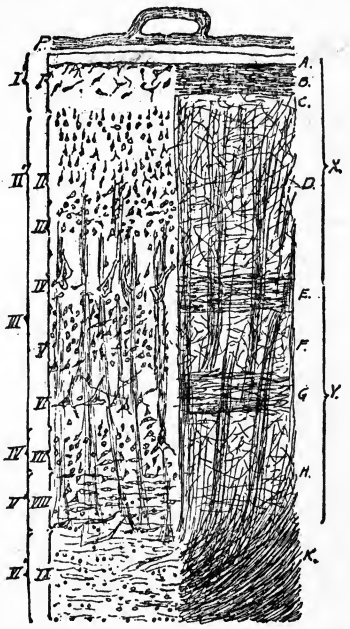

FIG. 3.—To show the arrangement of the layers of cells (left side) and that of the medullated fibres (right side) in the adult human cortex, occipital lobe. (Schematic, Meynert and Obersteiner.) *P*, the layer of pia with a blood-vessel; *I–IX*, the layers of cells as found in the cortex of the sensory regions. (Meynert.) *I′–VI′*, the layers as they would occur in the cortex of the motor regions. The medullated fibres are distributed in the following layers, *A–H*. *X* includes the outer group, *Y* the inner group, of tangential fibres. (From Donaldson's Growth of the Brain.)

§ 3. The Aim Suggested by Present-day Psychology.

57. The vital relation of the mental and the motor in human life is indicated in the results of experiments by Breese, who shows [1] that "in many trains of thought the content is almost entirely composed of the muscular complexes involved in the language of expression of the thoughts. The usual mental content accompanying such a word as 'bubble' is inhibited if one tries to think the word with the lips wide apart. On the other hand, vividness of mental process is produced by an intensification of the motor elements accompanying the process. If, while engaged in some mental work, such as reading or adding a column of figures, one is distracted by stimuli foreign to the work, the attention may be held to the task by reading aloud, *i.e.*, an increase in the intensity of the appropriate motor adjustments increases the stability of mental processes. A general intensified motor activity accompanies any attempt to overcome mental distraction.

"The inhibitory effect which the suppression of motor activity has upon consciousness is not limited to the vocal apparatus. It is general. The whole motor mechanism is involved in the psycho-physical processes. In general, *inhibition of the motor elements tends to inhibit consciousness.*"

So Wundt says [2] that emotion always produces physiological movements. Years ago Brown-Séquard [3]

[1] On Inhibition, Psychological Review, Monograph No. 11, May, 1899, p. 58.

[2] *Op. cit.*, p. 381. Cf. Shaw, The Employment of Motor Activities in Teaching, Popular Science Monthly, Vol. L., pp. 56–66.

[3] See his Physiology and Pathology of the Central Nervous System.

suggested the principle of dynamogenesis, the motor expression of mental states, which has recently been extended by Baldwin and shown to have universal applicability. The principle of contractility, he says,[1] which has been established in biology affirms "that all stimulations to living matter—from protoplasm to the highest vegetable and animal structures—if they take effect at all, tend to bring about movements or contractions in the mass of the organism. This is now also safely established as a phenomenon of consciousness—that every sensation or incoming process tends to bring about action or outgoing process." The peculiar effects of particular sorts of stimuli, which we commonly believe never issue in any motor effects, have been determined by experiment, as in the case of colors and tones. "The ticking of a watch is more clearly perceived if movements are made at the same time. Further, the reaction-time of hand movements is shorter if the stimulus (sound, etc.) be more intense. There is an enlargement of the hand, through increased blood pressure, when a loud sound is heard." [2]

58. For what purpose, in the conception of modern scientific thought, has man been endowed with perception, memory, and reason? fear, anger, and love? If we seek to answer these questions by inquiring into the *raison d'etre* of mental activities in ourselves and in those about us we shall find that

[1] Mental Development, Methods and Processes, p. 116. See, too, his Feeling and Will, p. 281. Also James, Principles of Psychology, Vol. II., Chap. XXII.

[2] Baldwin, *op. cit.*, p. 44. See, also, pp. 165 *et seq.;* and Triplett: Dynamogenetic Factors in Pacemaking and Competition, Amer. Jour. of Psychol., Vol. IX., pp. 501 *et seq.*

thought and feeling always subserve the practical requirements of adjustment. As James has said,[1] the ends of thinking are of a practical character; we perceive, reason, and remember to help us to get on the right side of things so as to increase our pleasures and reduce our pains. Intellect is ruled by practical interests. Cognition is but a fleeting moment, a cross-section at a certain point, of what in the large is motor phenomena. "In the lower forms of life no one will pretend that cognition is anything more than a guide to appropriate action. The germinal question concerning things brought for the first time before consciousness is not the theoretic 'What is that?' but the practical 'Who goes there?' or rather, as Horwicz has admirably put it, 'What is to be done?'—'*Was Fang' ich an?*' In all our discussion about the intelligence of lower animals the only test that we use is that of their acting as if for a purpose. Cognition, in short, is incomplete until discharged in act: and although it is true that the later mental development, which attains its maximum through the hypertrophied cerebrum of man, gives birth to a vast amount of theoretic activity over and above that which is immediately ministerial to practice, yet the earlier claim is only postponed, not effaced, and the active nature asserts its rights to the end."[2]

When one puts to his own thoughts the question, What end have you in view? he will discover that

[1] The Will to Believe, etc., p. 114. See, too, his Prin. of Psychol., II., p. 379. Cf. the following: Titchener, An Outline of Psychology, p. 98; Butler, The Meaning of Education and Other Essays, pp. 13–15; Guyau, Education and Heredity, p. 287.

[2] James, *Ibid.*, pp. 84, 85.

there is always some *need* to be ministered to,—some situation to be understood, and right action established with reference to it. It may be that there are phenomena in the physical world that must be looked into, and their causes and their outcome determined so that the appropriate behavior with reference to them may be instituted. Or, more likely, there is some relation toward one's fellows that thought is busying itself with, reviewing former actions and planning new ones. And to what end? Always that conduct may be so ordered that one may be kept in contact with influences that heighten the tide of life, that increase the sum total of health-giving influences —ethical, intellectual, physical—and that destructive, pain-giving forces may be avoided.[1] As McLellan and Dewey have put it,[2] our most profound tendencies, both instinctive and acquired, have for their aim the constant use of means to attain some sort of ends that have practical worth for us.

59. If we try to follow the development of mind from its simplest beginnings in the race we see appearing one after another mental faculties whose function in adaptation is apparent. In the course of this development there appears a power which is of incalculable advantage to the animal so fortunate as to be endowed with it,—the ability to react to things in the environment in the light of previous reactions, so that the necessity of going over the original experiments again is obviated. In the beginning a creature could hardly tell whether an object would give it pleasure or pain without

[1] Cf. Baldwin, Mental Development, Methods and Processes: chaps. on the Theory of Adaptation.

[2] Psychology of Number, p. 66.

really trying it. Knowledge of the properties of a thing could be obtained only by direct physical contact with it. But when visual and auditory perceptions are developed, properties of an object can be determined without actually touching or tasting it. With the advent of these powers the sphere of adjustment was immensely broadened and perfected; and surely their conservation is due to the fact that they have been of *service* to the individuals possessing them. The same is true of the other powers—imagination, reason, and the rest: each gives some distinct advantage in adjustment, and survives for this reason.

60. These powers reach their highest stage in the human mind. But they are so complex, and the correspondence of a human being with his environment is so broad and so refined, and the psychical processes involved are so delicate, so intricate, so elaborate, that it is easy to think they exist merely for the sake of existing. But is it not impossible to conceive that a certain plan should be followed in the building of the mind until human life is reached, and then that an altogether different scheme should be adopted? And why should a different plan be needed or desired? Perception is none the less to be admired, none the less ideal and spiritual, because it is concerned with the world of people and things which environs one, and which he helps to make, augmenting its pleasures and lessening its pains for all living things, or *vice versa*. Reason loses none of its divine character because it reveals to man the way in which the universe is organized, and teaches him how his own behavior should be regulated so that he may co-operate with and not set himself against its forces.

Indeed one must have much greater regard for a mind that can thus be of service than for one that has no reason for existing other than to unfold itself or to be disciplined without reference to the environing world. One must behold with delight and ever-increasing wonder a thing which is capable of retaining old experiences, for example, so that they may be a guide for future emergencies. There is no inspiration in regarding memory as a reservoir designed to hold everything which is poured into it without respect to what it is or how it bears upon the course of life. There is deep significance in those researches of Helmholtz's on the eye and the ear, which show that practical utility determines what of the manifold things that appeal to us we shall be aware of, and what we shall ignore. "We notice or discriminate an ingredient of sense only so far as we depend upon it to modify our actions. We are acquainted with a thing as soon as we have learned how to behave towards it, or how to meet the behavior which we expect from it. Up to that point it is still 'strange' to us." [1]

61. Not only have the intellectual powers been developed for the purpose of adjusting man to the world, but his emotions have the same end in view. For what reason has he become possessed of fear but that he may avoid the objects which will destroy him, either physically or socially? And why should one have affection except that thereby he may become allied to his fellows in ways helpful to them and to him? When he can do unto others as he would be done by he promotes his own well-being and that of others. And so with all

[1] James, The Will to Believe, etc., p. 85.

the other emotions; each one plays its part in bringing men into closer correspondence with the world—and not the physical world merely but the social and the æsthetic worlds as well.

62. Many of us are apt to feel, as Plato did, that there is a phase of the mental life that is removed far above the needs of daily living, and is concerned alone with the True, the Beautiful, and the Good, which should be striven after for their ideal value, and not because they could or should exercise an influence upon our conduct. For Plato pure truth is at least three removes from the world of things, which is the "shadow" world; and to him the only worthy purpose of thinking appears to be the attainment of this abstract ideal truth, which can be reached only by dialectic.

But the thing Plato regarded as pure truth we of to-day consider to be little more than a system of verbal propositions—the shadow of truth, to use his own descriptive term. Truth is apprehended only when the mind becomes adjusted to the world about it, sees the uniformities in phenomena, thinks in accord with the constitution of things. There is a kind of physical truth, too, which arises when the body is brought into harmonious relation with the physical world by which it is conditioned. Truth and Beauty and Goodness are just the agreement or congruence or harmony between the organism and its physical and social environments. Error and ugliness and sin result from opposition or antagonism or conflict between the organism and the environing world. In their effort to glorify the ideal, because they felt the real was common and base, it seems that the Platonists have overlooked the fact that when the soul is filled with thoughts of the True,

the Beautiful, and the Good, and with emotions relating thereto, one's relations toward those about one will be affected beneficially, and that therein lies the value of such thoughts. Professor Ladd must be right when he declares [1] that the purpose of all our philosophizing is to discover how we ought to live, to see if it is worth while to make strenuous endeavors, or whether we should let things go as they may, or perhaps give up altogether. Again, our most complex sentiments and volitional acts relate to our well-being, either immediate or remote, either spiritual or physical. M. Espinas asks [2] what sentiment is if not the resultant of a "more or less obscure view of the dangers or disadvantages which may accrue to us?" And we answer, nothing more than this, if we include also the resultant of a sense of the advantages and pleasures which we anticipate will accrue to us. Of course the complexity of the mental life makes it exceedingly difficult to track our thoughts and feelings out to their conclusion, and this leads us often to stop with the first part of the cycle as though it had no completion. The intricacy of this task has been indicated in an effective way by Maudsley, who says [3] that if we would search the depths of a person's character, in order to discern the motives of his conduct in every situation in life, we would be compelled to unravel his whole mental development, and undertake in historical retrospect "an analytical disintegration of the mental development of the race from its beginning."

63. It seems proper to note here a point which will

[1] A Theory of Reality; Introduction and first page.

[2] Quoted by Guyau, *op. cit.*, p. 287.

[3] Body and Will, p. 10.

be discussed in detail later,[1] that while all ideas tend to influence conduct, yet their success in achieving this must depend, of course, upon the proper environment being presented therefor. One may know, for instance, that wild animals are dangerous, and that the best thing to do when they present themselves is to escape to a place of safety; but if no wild animals ever appear in his environment this knowledge will never materialize in action. So a farmer may have many ideas relating to the ancient languages, but while he is at work upon his farm these ideas with their correlated feelings cannot appreciably modify his action so far as the raising of his crops is concerned. His action in the present must be the outcome of impulses aroused by stimulations now impinging upon him and modified in their movement toward motor action by experiences, either his own or some one else's that he has appropriated, and that have been gained in the past by dealing with similar situations.

It is difficult to see how the mind could have been worked out on any other plan and made an effective medium for adjustment. If action in a present situation was not determined by the outcome of previous actions in similar situations how could adjustment ever be attained? Suppose that all ideas, no matter of what realities they are the representatives, tended to or even could influence conduct regardless of time and place and circumstances, what sort of a life would one live, anyway? When the engineer went to dinner with a friend his engineering ideas would be directing his

[1] In Part III.

actions, and he would be dealing with his host as though he were a locomotive, or a bridge, it might be. So when the classicist repaired to his garden in the evening to hoe his corn he would look upon the tender blades as Greek roots, and he would react to them in a grammatical way. Occasionally one sees something of this sort in asylums when the subjective has become alienated from the objective world, and new experiences do not awaken the appropriate memories, and so right adjustment is not secured; men are animals, brooms are horses, and all is hopelessly confused. Sanity requires that in reacting upon a given environment those ideas and impulses only that relate thereto should be active, for in no other way can adaptation be attained.

§ 4. The View of Sociology and Ethics.

64. Thus far we have glanced at the conceptions of human nature given by those sciences that regard man from the biological, evolutionary, neurological, and psychological standpoints, and we have found agreement in the evidence gained from these different sources, all suggesting the perfecting of adjustment as the end of educational effort. If we now regard our subject from the standpoint of the sociologist, we shall have this view re-enforced. The sociologist maintains that man is a social being, and he declares that his welfare depends upon his acquiring social insight and social goodwill so that he may co-operate with his fellows in all the affairs of life. The sociologist always looks upon man as a reacting being; that is the point. Baldwin emphasizes this point in an elaborate way,[1] showing

[1] Mental Development; Social and Ethical Interpretations.

that the largest part of the child's energies are expended in getting adapted to his social environment—obeying it, imitating it, directing it, but always reacting upon it. The child is never static in his relation toward people; he is not indifferent to them; whether he will or not he must assume an attitude toward them. Vincent has said [1] that "what we have been calling the powers or activities of the mind are nothing more than abstractions from concrete states of consciousness, and these always have a social content; . . . the individual can exercise his powers upon social materials, and in attempting to secure for himself discipline he appropriates in some measure the social tradition, and may be the means of its transmission and further elaboration."

Ever since Plato's day thoughtful men have realized that a human being cannot live apart by himself, thinking and feeling without regard to the issue of mind and heart in conduct. The Republic, the Politics, and many a great work since Grecian days bears testimony to the belief of eminent thinkers in all times that an individual cannot be permitted to behave as though he were the only person in the world. "There is no individual man," says Professor Tufts,[2] "for ethics, for psychology, for logic, or for sociology, except by abstraction—that is, if by individual man we mean a being not influenced by social forces—nor are there any feelings, thoughts, or volitions in any man which are independent of such forces." Butler voices the opinion of most of the thinkers in the sociological and educational world to-

[1] The Social Mind and Education, p. 92.

[2] American Journal of Sociology, January, 1896, p. 455.

day when he says,[1]—"The entire educational period after the physical adjustment has been made, after the child can walk alone, can feed itself, can use its hands, and has therefore acquired physical and bodily independence, is an adjustment to what may be called our spiritual environment."

65. Education, then, from this point of view, must seek to develop social *action;* it can take no account of possible thought or feeling which exercises no influence upon one's behavior toward his associates in the business of life. Professor Howerth has argued[2] that the social aim in education is coming to dominate the thinking of educationists everywhere. There is a growing conviction that the school cannot have for its leading principle the improvement of the individual as an isolated being, although, as a matter of fact, genuine individual betterment must, for the most part at any rate, result in advantage to the social whole. But still it is possible, as is shown in the sort of thing seen in monastic institutions, to plan a *régime* where the individual seeks to develop a virtuous life in seclusion. Here the mind is turned in upon itself, and the supreme end of existence is thought to consist in purifying the soul by deeds having no reference to other souls. Life is a purely individualistic affair, and goodness is attained by the discipline of self in a penitential way, rather than by conducting oneself in harmony with the rules essential to the well-being of the social whole. But we

[1] The Meaning of Education, p. 13. See, also, Vincent, *op. cit.*, p. viii; Harris, quoted by Putnam, *op. cit.*, pp. 14 *et seq.;* Dewey, Educational Creeds of the Nineteenth Century, pp. 1 *et seq.*

[2] Journal of Pedagogy, Vol. XIII., Nos. 1, 2, and 3.

are abandoning this conception of the ideal life, and are coming to the place where we may say, as Professor Laurie does,[1] that the virtuous life is not one of contemplation simply, but of action; it is not abstract, but concrete, being comprised of daily and hourly virtuous acts. We would not, if we could, rear citizens who talk about virtue and "walk about displaying moral placards," but citizens who do their duty, and are "ever watchful over themselves in all the details of business and of social and family intercourse."

66. If we turn now for a moment to the conception of a human being which ethics gives we will find that here, too, he is looked upon as an active being, one having relations always toward his fellows that must be brought as nearly as possible to the ideal. It is true that many ethical writers and teachers, from the days of Socrates,[2] have busied themselves prin-

[1] Institutes of Education, p. 32.

[2] There is a good historical sketch by Henry Sedgwick in the Encyclopædia Britannica, ninth edition, Vol. VIII., in which is pointed out, I think, the fact that most ethical writers have had man's practical, relational life chiefly in view in the elaboration of their ethical systems, however much may have been said about absolute Right and Good and Duty. Of course a great deal of ethical writing has *seemed* to regard life only on the ideal side; one lives ethically in thought, not in deed. But the test of a system after all has been indicated in the question, How does it work in daily life? If one will follow out such writers as Locke, for instance, when he says, "The great Principle and Foundation of all Virtue and worth is plac'd in this; that a man is able to deny himself his own desires, cross his own Inclinations, and surely follow what Reason directs as best, tho' the Appetite lean the other Way," he will see that they really have in mind the practical life. Why resist your desires? Because reason will lead you into

cipally with the discussion of ideal character, wherein the impression has often been conveyed that the ethical life is an individual, personal matter. But still the criterion of character in the last analysis has always been the outcome of conduct with reference to one's neighbors. Even those who feel, as Plato apparently did, that there is a Right and Good unrelated to social conduct, yet they think it desirable to have a system of practical ethics which will deal with man's concrete life, teaching him what is right and good in his treatment of his fellow-men. In recent times, though, ethics has concerned itself mainly with the active, relational life. We hear much now about the ethics of trusts, the ethics of business, the ethics of medicine, and so on. It is thus really the science of right in human *conduct* and the reasons therefor;[1] and in this sense its aim is to perfect the adjustment of men, and it can never be content with getting people to think about ethical behavior and not *live* it, if such a thing be possible. Man must indeed first think and feel what he *does;* but to stop at simple being, whatever that may be, with a creature whose life involves continual reaction upon external things would be to stop short of the completion of life, which does not "consist in being and reverie, but in activity determined by the state of being."[2] Have not ethics and religion, in their vital forms in real life, if not in books, usually aimed to give

more harmonious relations with men and things. Locke would not counsel resistance just for the sake of resisting; he expects that the power thus gained will be of advantage in the situations of every-day life.

[1] Cf. Paley, Moral Philosophy, 1, I.

[2] Laurie, Institutes of Education, p. 24.

direction to the issues of life, either patently or implicitly, paying attention to the heart only because this is the mainspring of all conduct? Account is taken of what one thinks, because as a man thinks so is he. But it is not the activity of mind or heart *per se* that has really occupied the attention of men most familiar with human nature, but rather the outcome of such activity—conduct that is to say, or adjustment to the world.

CHAPTER VI.

THE IMPLICATIONS OF ADJUSTMENT AS THE END OF EDUCATION.

§ 1. The Recreation of Environments.

67. Adjustment implies a process of fitting things together; of getting them into harmony with each other; of so relating them that the intentions, as it were, of each may be realized and not thwarted by acting in opposition to one another. So in order that this process may occur the things concerned must of course bear an active relation toward each other, and they must so deport themselves that there may be congruence and co-operation instead of antagonism or indifference between them. Static, sphinx-like bodies can never adjust themselves to each other, or to anything else. And now when we speak of an individual adjusting himself to his environments, our language suggests that the environments are fixed, unchangeable, and that he conforms his actions to the demands of these changeless things. He must take things as he finds them, and conduct himself accordingly. The world cannot be altered; he must do all the adapting on his own part. If this were a correct view man would be compelled to eat the food that nature in her wild state produced for him. He would have to find shelter in the caves and dens which

he found ready to hand, or seek a temperature where the winds and weather would be tempered to him in his nakedness. So for his æsthetic wants he would have to depend upon the beauties spread before his eyes in the earth at his feet and the heavens above his head. Intellectually he would have to be content with such a knowledge of the plan and workings of the universe as he could derive from incidental observation.

But such a view is, of course, exactly contrary to fact. Man, civilized man at any rate, is satisfied with nothing as he finds it in its raw state. In whatever environment he be placed he at once reacts upon it by modifying it so that it will the more fully minister to his needs. He does not accept the food which crude nature proffers him, but he manipulates the forces that produce food in such a way as to secure varieties and qualities and quantities that supply his physical wants most satisfactorily. He cultivates his fields and fertilizes them and tends his crops, and never lets nature work out her original designs, for his highest good is not promoted by her unaided and undirected efforts. And his love of what is beautiful is not satisfied by nature's art productions. He must make over practically everything she has constructed until it comes to assume such forms and figures and designs as will afford him a feeling of harmony that is not awakened by most of the things he finds ready made. So man is ever remodelling, reconstructing, recreating his environments; they are not static in his hands, or unmodifiable or permanent in their original forms. His spiritual and physical needs, not the environments, are the really permanent things in the adjusting process. Adjustment, then, does not mean that the individual

fits himself into the world, so much as that he makes the world fit him.

68. The point in view here is brought out more clearly when man in his attitude toward the world is compared with lower forms of life. The amœba takes things as they exist and adapts himself to them without making an effort to modify them. He accepts without complaint what food his habitat affords him, and he makes no attempt to cause two blades of grass to grow where one grew before. He pitches his tent wherever night overtakes him; he does not bestir himself to make the objects that surround him more seemly and attractive than they are in their native state. In short, he does nothing to remodel the world in which he lives; it satisfies him just as it is. The fish, too, seems at ease in the enjoyment of things just as they have been provided for him by nature. But not so with the bird or the beaver; they find that the world in its original forms is not best adapted to their wants, so they work upon it and change it—they re-create it. It is not until human life is reached, though, that re-creation of environments can be said to be the really important factor in the process of adjustment. But here it is an evident truth that "man is not the passive victim of his environment, but has such power of modification and control as either to transcend that environment or virtually to re-create it." [1]

69. Again, the term Adjustment, as it is ordinarily employed, suggests simply a mastery of the world which the race has already discovered, and some educators seem to interpret it in this way. Education,

[1] Philosophical Papers, University of Michigan, p. 12.

they say, must strive to lead the individual up to the point which mankind has reached in its learning and its skill. He must be led to "share in the intellectual and moral resources which humanity has succeeded in getting together. He becomes an inheritor of the founded capital of civilization." [1] Again, education is the "process by which the individual is elevated into the species. . . . It gives the individual the wisdom derived from the experience of the race—what nature is, what its laws are, and how it can be made useful to man; what the experience of human nature has been, what the manners and customs of men are, and what have been the motives which have governed human action." [2] Or in the words of Laurie, "reason in each has to be so trained that the young may intelligently acquiesce, and so make the transmitted moral and spiritual life their own." [3]

According to the letter of these propositions, if the school leads the pupil to assimilate into his own conduct the adaptations which have been worked out by the community in which he lives it will have accomplished its highest purpose. But this is manifestly an understatement of the case. It is assumed that the race has already achieved perfect adjustment—that the forces which condition human life are fully understood; that all the possible modes of utilizing them for human advantage have been discovered; that an ideal ethical and political life has been achieved. But

[1] Dewey, Educational Creeds of the Nineteenth Century, edited by Lang, p. 5. Cf. also Butler, *op. cit.*, pp. 36, 37.

[2] Harris, Educational Creeds of the Nineteenth Century, p. 36.

[3] The Institutes of Education, p. 27.

one needs only to glance at this doctrine to feel its insufficiency. Since Darwin's day the thought has become familiar that the race is adapting itself to the world in a progressive way. A great deal has already been accomplished, but it is likely that the half has not yet been done. We all know practically from the pains we suffer and the defects we bear that there are still to be made many points of connection between man and the world in which he dwells. We possess capacities for correspondence which have not yet been exercised to their full limit, and needs that the experience of the race has not yet been able to minister to fully. So the individual must not only learn what has been done, but he must strive to make further progress; to be a discoverer of better ways of doing things—he must be an inventor, that is to say. The school must awaken and nourish in him a disposition to keep making improvements upon the tradition that he has inherited; to deal with situations in original ways as conditions demand. The housewife cooking just as her ancestors used to; the teacher applying formal and antiquated dogmas to every situation which arises in his schoolroom; the minister preaching a formal theology without reference to the needs of the men and women who listen to him; the farmer planting his corn and potatoes on a certain day of the year, as tradition advises him to do, regardless of the season, the climate, the soil—such people have not the right attitude for the best adjustment to the world.

70. And then in the larger view, investigation to establish new truth is as much a function of education as the teaching of the truth that is known; both are essential for adjustment in the proper sense. As the

school is found in most civilized countries to-day it is striving to accomplish more or less efficiently this double task—to lead the pupil into a mastery of what the race has achieved, and to develop in him the attitude of the inventor. Vincent has pointed out[1] that in earlier and simpler phases of social organization education was conducted in a haphazard fashion, parents transmitting to their children current beliefs and customs and simple dexterities; but as civilization has progressed instruction has become more fully organized, until now all progressive nations seek not only to transmit to each new generation what the race has discovered, but strives also to add to what has already been discovered, not only in matters of the intellect but also in matters of the heart and will.

§ 2. The Supreme Aim in Adjustment.

71. It was mentioned in another connection that the supreme end of human activity is the increase of pleasure in the highest sense and the diminution of pain. Doubtless men have always believed this more or less fully and explicitly, but it remained for Spencer[2] and Bain[3] and their followers to bring the principle directly before the minds of people, and to show its universality. Baldwin[4] has worked the conception out in detail,

[1] The Social Mind and Education, p. 91.

[2] See Principles of Psychology, Vol. I., section 227 *et seq.*

[3] See his Emotions and Will, third edition, p. 318 *et seq.*

[4] Most of his Mental Development, both Methods and Processes, and Social and Ethical Interpretations, is in one view devoted to an exposition of the theory in its foundations and in its consequences; but see especially the Theory of Development, in Methods and Processes, chap. 7.

and he has left little room for scepticism regarding its validity.

The question of just what pleasure, or perhaps one should say *happiness*, consists in, must be put aside for the moment; what is important here is a recognition of the principle that the *raison d'etre* of all activity is the securing of stimulations which give pleasureable experiences. And the rationale of this is evident, since pleasurable experiences "heighten the tide of life," preserve and strengthen the organism, give it greater power of endurance, and enlarge its scope of correspondence with the world. On the other hand, pain lessens vital action, tends to destroy the organism, is in a sense a warning to it that agencies are affecting it which are injurious to it. This fact is revealed in the psychological laboratory,[1] where it may be shown that pain, whether organic or mental, reduces the vigor and amplitude, so to speak, of vital function. Titchener informs us[2] that pleasantness expands the arteries running just under the skin, which results in the increase of bodily volume; a pleasant experience also produces deeper breathing, an increased pulse rate, and augments muscular power. On the other hand, an unpleasant experience has just the opposite effect; it lessens bodily volume, produces lighter breathing, weaker pulse, and reduces muscular power.

72. The plan of the motor mechanism of the body, as Baldwin and others have observed, suggests that it

[1] See Angell and Thompson, The Relation between certain Organic Processes and Consciousness, Psychological Review, January, 1899. See also Mosso's Address at the Decennial Celebration of Clark University, published in the Proceedings.

[2] An Outline of Psychology, p. 103.

was arranged with a view to the securing and perpetuating of pleasurable stimuli, and the fleeing from those which may cause it harm.[1] There are the two great classes of muscles, the one class concerned with extension and employed in coming up to and seizing objects, and the other class concerned with contraction and withdrawal and employed in getting away from objects.

73. One who will follow a child in the undertakings of daily life will see how his activities are all directed toward the realization of this great aim; and while the complexity of adult life, in respect alike of motives and of outcome, makes it difficult, if not impossible, to discern exactly the purport of many acts, still those we can trace are always headed in the direction of the eudemonic goal, in either the immediate or the distant future. There may be rough places enough before the goal is reached, but the prize, we think, is worth the struggle; the pleasurable end justifies the painful means. An inventory of one's thoughts and feelings at any moment will show that they are directed toward ends hedonistic—hedonistic in the broadest sense, not in respect of things physical alone nor principally,

[1] Pfeffer has shown that this same principle holds in plant life. The activities of a plant may all be reduced to the two great classes, those concerned with perpetuating pleasurable experiences, and those concerned with escaping from painful experiences. See the Revue Scientifique, December 9, 1893. Jordan and Heath show in their Animal Forms how every detail of structure from the bottom to the top in the animal series is determined by the supreme aim of securing pleasurable and avoiding painful experiences. They indicate in their Animal Life, too, that this same great aim rules in the mental functioning of animals.

as Aristippus and his Cyrenaic school would have us believe.

74. But there are those who will declare that their conduct is not shaped at all by the desire to attain happiness. Most persons are indeed strongly prejudiced in their theories against taking a view of human life which makes it seem to be anything less than a strenuous endeavor to do what is right, even though this causes pain, as it often does. It is maintained that in a large proportion of our activities we have no regard for the pleasure they may bring us; on the contrary, we know beforehand that many of them will produce discomfort. But yet, in order to obey the dictates of conscience and to discipline character, we resist the temptations of pleasure, and voluntarily bring pain upon ourselves. But is it not inconceivable that any sane person should conduct himself in a way calculated to augment pain-giving experiences, except that he may as a result thereof attain pleasure-giving experiences of still greater moment? No individual capable of preserving his life could be so indifferent to the effects of his action upon his well-being. How could life be maintained if pain were sought after as an end in itself ?[1] Nature had to make pleasure a criterion of the perfectness of correspondence with environment, and an impelling force to attain harmonious adjustment. And lack of correspondence had to be corrected by the stimulus of pain,

[1] It is, of course, well known to psychologists that certain neurotic individuals find a kind of pleasure in pain, but even here the end is pleasure, though strange means of attaining it are resorted to. These cases are, however, very rare, and are always pathological.

which would stop the individual from pursuing a line of conduct that would destroy his organism, or cause him to drop back upon a lower platform in the scale of life. Surely the prosperity of any living thing must depend upon the extent to which it can keep in contact with those phases of its environment that heighten the tide of life, and avoid those that depress it. And the same is true in principle of individuals banded together and forming a social organism. Pearson has well said[1] that "The sole reason that can be given for any social institution or form of activity—I mean not how they came to exist, which is a matter of history, but why we continue to encourage their existence—lies in this: their existence tends to promote the welfare of human society, to increase social happiness, or to strengthen social stability." And of course the strengthening of social stability will increase social happiness; if this were not so, it would never be encouraged.

§ 3. Varieties of Pleasure in Human Life.

75. When one thus makes the end and criterion of conduct to be the attainment of pleasure he is sure to awaken misgivings in the minds of many, for the reason that this term indicates to them something of a physical character simply, and a sensuous character at that. It suggests luxury, dissipation, idleness, wantonness; and the race has learned that these are but a mockery, or worse, and the one who spends his days in the pursuit of them must make of life a gross failure. Sensuality cannot be the end of exist-

[1] *Op. cit.*, p. 8.

ence; indeed people are coming to see that in a very real sense it limits the efficiency of the organism. It destroys endurance, and the higher and more complex functions of mind and body. It undoes, as Maudsley and others have pointed out, what has taken the race untold ages to develop. So man is struggling to get beyond the point where physical indulgence is made the end of endeavor. But the desire for it is not yet eliminated from the human heart, and it must be combated without ceasing or it will gain ascendancy in conduct. Life must be lived on a higher plane; the physical must be subordinated to the spiritual parts of one's nature.

And this doctrine has been maintained throughout the history of civilization by all great thinkers. No one to-day realizes its truth more fully than did the Hebrew prophets or the apostle Paul, or Plato or Aristotle or Seneca or Marcus Aurelius or Thomas Aquinas or Goethe, or a host of other great teachers who have shaped the thoughts and purified the aspirations of people for the last twenty-five centuries. The civilized world has long felt that the subjection of the physical to the social, the ethical, the religious in man's being, will result in the greatest good to the individual and to his fellows, and this is the view which is endorsed alike by science and by experience. Man has other relationships to his environment than those of a purely physical character. Adjustment to the world means far more than the gratification of appetite. Man's organism has been so constructed that it responds to spiritual as well as to physical stimuli which impinge upon it. Surely this is in accord with our conception of man as the

highest species in the scale of life. If he could not touch the world on any other than a physical side; if he could experience no pleasure but that of a physical sort; if he could appreciate and react to no experiences but those derived from the immediate contact of material objects with his organism; if the social and religious worlds were not just as real, and if they did not determine his well-being in just as important a sense, then why should man be counted any higher in the scale of being than the amœba?

76. If it were the intention of nature that man should strive after physical pleasure alone, a serious mistake has been made in giving him such a fearfully complex organism, where there is so great instability and so great likelihood of lack of correspondence producing discomfort and pain. The amœba is the best device for attaining the sort of pleasure which is indicated in the term *sensuality;* for this simply organized creature is much less apt to be thrown out of rapport with its environment, and so to experience the distress which ensues when a living thing loses its bearings. Have not most intelligent people long felt that if man exists for the sole purpose of securing that which relates to sense and appetite, his life must be regarded as a failure, for the pains in most instances outweigh the pleasures? Certainly the momentary agreeable sensations of dissipation and sensuality are far outbalanced by the discomfort which they produce in the long run. But even physical pleasure in largest measure is secured only by strenuous living, which chooses the higher and permanent over the lower and temporary.

which estimates strength and poise and agility and health above weakness and incompetency and disintegration. We are coming to see, as someone has said, that what is physiologically right is morally and socially right. There is no conflict between the proper demands of the different interests of the human organism; they have been worked out so as to complement and support one another.

77. There are then vital forms of pleasure beyond the purely physical to which man is able to respond, which his nature entitles him to enjoy, and which his education should prepare him to attain. It is evident that he was destined to perfect the adjustments which will secure these pleasures, and if he does not do so he will fail to reach the highest point which he is capable of attaining. Moreover, being endowed with impulses which urge on to the accomplishment of complete adaptation to the environments affecting the spiritual part of his being, he must suffer pain of the most serious sort if he cannot attain it. It is apparent that in the process of evolution man's being has been made sensitive to aspects of the world of which lower forms of life are unaware. In the amœba every part of the organism may perform all the offices of which any portion is capable; and, as a consequence, the animal can perform only the simplest functions of organic life—digesting its food and reacting mechanically to objects in immediate contact with its body. It has no knowledge of a visual or an auditory world; it can neither remember its past nor foresee its future; it lives to eat, and it is in a sense all stomach, with just enough equipment in other

respects to achieve the great end of its existence. When we come to the hydra, though, we behold something like a colony comprising several parts all working together as a unit, but particular parts having charge of special duties, and being specially prepared therefor, of course. One group of cells becomes more sensitive than the others, and attends to the work of informing the colony what sort of objects exist in the environment; another group confines itself to digestion, another to locomotion, another to reproduction, and so on.

So if we look on through the whole scale of life we see at every succeeding stage greater delicacy of response to the world in some respect, which implies a broader appreciation of the realities in the environment, and greater amplitude of adjustment. But an increase in the range of adaptation requires greater complexity of organization, an exposure to more stimulation, the power of response to new forces, and for an animal so organized prosperity depends upon meeting all these relations successfully. The opportunity of coming in contact with the world in a large way implies the necessity of achieving that adjustment upon the penalty of destruction, partial or complete. One who has faculties must use them; if they are not employed in gaining the pleasures of higher adaptation they will bring upon their possessor the miseries of lack of adaptation. Then when we see a human being so highly organized that we can discern only the chief types of his activities, we can appreciate the need of making his education do for him far

more than the sort of thing which would be appropriate for a monkey or a savage.

78. Without question the primary requisite in the life here below is the preservation of the body; intellectual and moral modes of response were, in their incipient forms, designed to meet the physical needs of the organism. But in human life the spiritual interests have acquired a certain independence. There is no such complete ministration of thought and feeling to somatic needs as in the lower orders of life. The principle of development here involved is illustrated in a way in the different functions of vision in the mollusk and in man. In the former case the eye simply discriminates light and shade, and it is confined in its activity solely to apprising the animal of the proximity of objects which may do it harm, or of objects which will furnish it food. It is probable that the visual consciousness of the mollusk contains nothing but information regarding food or enemies. But the eye in human life while discharging this primitive function does more; it reports the color and form characteristics of the material world; it gives appreciation of the æsthetic qualities of the environment without reference, directly at any rate; to their connection with the obtaining of food and shelter.

Of course this information often ministers directly to the needs of the body, but it is certainly not the case in all instances. There is a kind of exquisite pleasure in color and form as such. Human beings find a worth in colors and forms apart from their significance as signs of somatic values. Man thus experiences pleasure when in contact with what is

beautiful, while he suffers pain when he is exposed to stimulations from things ugly, while the mollusk is wholly indifferent to these qualities in things. And the hedonistic consciousness awakened in view of the beautiful and the ugly is just as real and exerts the same effect in principle upon the individual's happiness in the world as do the pleasures and pains of a purely physical sort. And what is thus true of man's æsthetic sensitivity holds in a far more important sense of his ethical, intellectual, and religious sensitivity.

79. One who fancies that the hedonistic consciousness is confined mainly to somatic experience must have overlooked the pleasure or pain coloring of all one's intercourse with his fellows. Surely one runs no risk in saying that every possible social relationship into which a person may be brought will stimulate reactions accompanied by more or less pronounced feelings of pleasure or pain. And what pleasure could be richer, could exert a more profound influence upon one's organism, than that which arises out of happy relations with the people about one? So, too, what pain could be more intense and destructive than that experienced by a person when he is not adjusted harmoniously to those with whom he associates? When one is not thought well of by his neighbors; when he is distrusted and driven from communion with his kind, what creature could be more miserable? So to be well thought of is worth more to most people than to be well fed and warmly clothed. It is easier to endure the pains of hunger and thirst than it is to forfeit the affection of those whom we love.

80. Every one will grant that an individual ought to know the world in which he lives on its physical side, so that he may best adjust himself to it, and thus derive from it all the pleasure it is capable of affording. But people have not so generally believed that he ought to understand it on its intellectual side, too, for the pleasure which understanding gives, even though this does not directly, or perhaps even indirectly, relate to the gaining of food or clothing or shelter, or even to more perfect social adjustment.[1] It will be readily acknowledged, though, that man is endowed with a mental constitution of such a character that he strives ever to comprehend the structure and processes of the universe of which he is a part. He is eager to know how the phenomena occurring unceasingly about him may be explained, what forces govern the operations of organic and inorganic nature, what power holds the sun and stars in their places, and so on *ad libitum*. The mind of man must put some interpretation upon the phenomena it beholds; it cannot remain static as it looks out upon the world. And how often is the explanation made in a superstitious way! The individual assigns a false cause to phenomena and then regulates his conduct

[1] I cannot agree with those, as Dewey, who maintain that every act has a direct social value, and should be determined by the outcome in social adjustment. My direct aim in studying astronomy is purely personal; it is only indirectly social, though of course I study what has been worked out by society. But I want to resolve my own intellectual problems, and so I study. I may share what I get with my fellows, and make a better neighbor, but this is not the chief aim in my studying. So I buy a beautiful picture for personal enjoyment, and not for social improvement, though the latter result may follow.

accordingly, with the result that he widens the gap between himself and his environments.

And then man finds pleasure in knowing the world for the knowledge itself. As Bacon says, "All knowledge and wonder (which is the seed of knowledge) is an impression of pleasure in itself." On the other hand, he suffers pain if he cannot see some uniformity, some underlying connection in the bewildering variety of phenomena which are occurring about him. Sanity requires that he reduce this "big, buzzing, blooming world" to simplicity as revealed in the laws of nature and of life. This profound impulse to acquire an understanding of things is manifested in a striking way in the early years. A child will usually forsake its dinner to investigate a new object that appears within its environment. This pleasure of knowing, we all realize, is intense in child life, and it is probably not less important in maturity, only the subjects dealt with are more remote from daily experience, and the method of treating them is more reflective, more quiet, less demonstrative, so that we are not apt to appreciate the intellectual interests of the adult. It is, however, the delight of knowing, and the distress of lack of understanding which is the incentive to investigation. As Samuel Johnson has said,[1] "A desire of knowledge is the natural feeling of mankind, and every human being whose mind is not debauched will be willing to give all that he has to get knowledge." Knowledge sets the mind free, gives it poise and balance and stability in the face of an apparently disorganized universe. And

[1] In Boswell's Life of Johnson, Vol. I., p. 530, Conversation on Saturday, July 30, 1763.

while in subtile, hidden ways it all doubtless influences in some manner and to some degree the practical activities of every-day life, unconscious as we may be of the fact, still, even though it gave nothing of this sort, yet it would in any event be of inestimable service in human life.

CHAPTER VII.

ADJUSTMENT AS AFFECTED BY SOCIAL ORGANIZATION.

§ 1. The Necessity of "Classes" in the Social Organism.

81. When one says that a course of school training must be planned so as best to fit the pupil for the life he is to live, he awakens in the minds of some of his auditors the question, But how can you tell what your pupil is going to do? Should every child be made ready for adjustment to all phases of the world? Will every person have the same adaptations to make, and so should all be put through the same educational regimen? The right answer to these questions is founded upon the doctrine that no man liveth to himself alone. Each is a member of a social organism; by his actions he either confers benefits or injuries upon it, and receives benefits or injuries in return. This relationship of the individual to the social whole relieves him from the necessity of doing everything for himself. His fellows will do some things for him—will really make his adjustments for him in certain respects. The division of labor in the social organism, with the pooling of results, bears a certain

resemblance [1] to the plan followed in biological organisms.[2] It is apparent, of course, that specialization of function in an organism is essential to anything like a highly developed form of life. One part of a complex whole must learn to do some one thing very well, and give the whole the benefit of its skill; and it will, in turn, derive benefit from the skill of all the other members. The organism is in this sense a sort of clearing-house, where all bring their special goods and get what they need in return.

In human society we see something of the same plan carried out.[3] In the earlier stages of development where the individual's adaptation to the world is not, relatively speaking, very complex, and consequently where needs are comparatively few, each person can look after himself quite completely. The mode of settling difficulties between man and man does not call for much beyond muscular force, and so the individual has no need for learning a vast body of intricate laws governing social regulations. There is no stock of knowledge or experience relating to the nature and method of treating human ailments which makes the services of a specialist in medicine necessary. So the individual can get what food he needs, can make his own clothing, can build his own hut, and so on.

[1] The resemblance is rather superficial than vital or profound; the individual bears no such non-individualistic relation to the social organism as the eye, for instance, bears to the somatic organism. Modern criticism of Spencer's theory has called attention to a number of fundamental differences.

[2] See pp. 111 and 112 for a statement of this plan.

[3] See Spencer's discussion of the subject in his Principles of Sociology (pp. 467–480), for a general statement of the matter.

But as the mind expands and grows keener in the course of evolution, and the world is touched at an increasingly greater number of points and in a more intricate way, with the corresponding complexity of reactions and needs, a person cannot do everything in the manner in which it must be done in order to meet all the demands made upon him. The æsthetic needs require great skill in the making of clothing, in the painting of pictures, and the like. The organic needs demand great skill in the manufacture and preparation of food, the management of machinery, and so on. As needs increase and the means of gratifying them are augmented, the relationship of one individual to another becomes far more intricate, and rules of government must become correspondingly more complex, so that it gets to be impossible for every individual to comprehend these and to construct others wisely as they are needed. So it results that in advanced racial development each individual member cannot, and is not required to, adjust himself to the world in all its aspects, in the sense that he must appropriate all that the race knows in every field and must make additions thereto.

82. We sometimes hear it said that it is incumbent upon the school to establish ideals of social organization and conduct, even though these are not in harmony with present beliefs or practice. It ought not to accept the forms of social organization and life which it finds in the community, if it thinks it can supplant these by something better. But this is at best only a half truth. Is it not really the primary duty of the school to get wrought into the activities of the young the principles in which the people

have already come to have faith? The business of originating a new order of things must be taken charge of, largely at any rate, by other institutions, or by a special investigating department of this one, which must be to a large extent independent of the instructional department.

The school is in the true sense a servant of society, not its master. It is fundamentally a conservator of the good that has been discovered and proven to be of service to man, and not an advocate of the thing that has not been tried, and concerning which there is great difference of opinion. Especially is this the case in respect of the relations of the various "classes" of people to one another. It is not within the province of the school to attempt to disturb the system which it is maintained to perpetuate through leading the young to adjust themselves to it. Society is in a state of extreme tension all the time. As in the human body so here, each member is seeking to get what he can for himself without due regard always for the well-being of other members. But as through natural selection there has been elaborated a biological organism whose members are quite harmoniously related to one another, so in the social organism there has been devised a scheme which works, although possibly not in an ideal way, yet its modification cannot be brought about best after the manner of a revolution. The various classes or members must be supplied as they are needed in order to keep up the life of the organism. If by any means it should be possible to keep all people out of any class for a generation serious results would surely follow. Think of a social condition where the class of law-

makers or laborers or physicians or teachers should become entirely extinct. It would be much as if in the human body the stomach or the teeth or the legs were missing.

This is the conception upon which the school must be founded. It is not privileged to destroy any form of social organization unless the community in greater part desires it. If the school be found in China, its proper function must be to get the ideals of Chinese and not of American life worked into the thought and feeling and action of each new generation; and what is true of the Chinese school is true in principle of the school in every community. It should be said, though, in passing, that in achieving this primary task, general education will be certain to bring about a rearrangement and better adaptation of things in the social organism.

83. But the question will be asked, Should the school in a democracy proceed upon the supposition that men are not born free and equal? Should education perpetuate class distinctions which require that one man should earn his bread by the sweat of his brow in order that another may enjoy himself in luxury? It is a commonplace fact, of course, that a democracy must be founded upon the principle that all its members should have equal opportunity. There may be written upon the statute-books no laws which will deprive any individual of a privilege or right to the advantage of others. But this does not imply by any means that all men are equal in capacity; that they can do the same things equally well; that they can attain in equal degree the ends for which all are striving.

All men struggle to secure those goods that will increase their happiness, but as the supply is limited the desire of every one cannot be fully gratified. Now give all the right to strive after them and one man will obtain more than his fellows. He has been endowed by nature with greater physical strength, it may be, or a sharper mind, so that he can discern how he must conduct himself in order to obtain what he wants. Or he may have greater self-control, or talents which enable him to serve men in such a way that they will reward him with a larger portion of the world's goods than they themselves possess. And when one thinks of it he wonders that people do not differ more than they do in capacity, for when there are so many individuals, the characteristics of each being determined by different environing influences, and a long line of forces acting through heredity, we should expect still greater variation in their powers than seems actually to exist. And it will be granted, surely, that in a democracy it is just as unfair, just as undemocratic, just as great a crime to prevent a man, strong in mind or character or body, from accomplishing what nature gave him the power to do, as to prevent the weak man from exerting his powers to their fullest extent in competition or co-operation with his fellows.

84. The practice, though (or perhaps one would be nearer right in saying the *theory*), in the schools of our own country tends rather towards the suppression of the exceptional individual, keeping him down to the level of mediocrity. We interpret the doctrine of equality to refer to the attainment of the same deserts by all instead of to the granting of equal op-

portunity. We have not carried the doctrine out to its logical conclusions yet, it is true, nor, on the other hand, have we adopted the opposite view. We stand confused in thought and vacillating in action between the interpretation of the doctrine of equality given by tradition and that given by ethics and science. What is needed to vitalize our education is an explicit recognition of the fact that *every* pupil in the schools must be given an opportunity to do his best, to achieve the most that he can in any direction. If there be one who excels the others by reason of native endowment or parental training or anything else, the school must be organized so that it can minister to his needs as fully as to the needs of his less fortunate fellows. To fail to do this is a crime alike against the individual and against society; for social well-being depends more largely upon the conservation of the strong, though they be but few, than upon the perpetuation of the weak, though their number be unlimited, just as the welfare of the human body is advanced more by two keen eyes than it would be by a hundred dull ones, and by two skilful hands than by dozens of clumsy tentacles.

85. Differences in capacity will manifest themselves mainly in respect of the degree to which individuals can adapt themselves to complex environments. The strong, well-equipped man, the leader in the community, is the one who can adjust himself better than his fellows to the more intricate phases of his environments. He can see more keenly the principles which rule human nature and can adapt himself better thereto, alike as an individual and as a citizen. Or he can penetrate further into the

mysteries of nature and lay open her secrets, and turn them to account in promoting the well-being of society. The weak man is overwhelmed by the complexity of the world; he stands powerless before it, and he lives his life on a lower plane of adaptation. The strong man is, generally speaking, *mentally* superior; the weak man is, generally speaking, superior in a *muscular* way, or at least he is inferior in mental vigor and acumen. The strong man will employ his powers in dealing with the complex phases of social life; the other will devote himself to the simpler needs of society, those which require a lower order of mental attainment. And the welfare of society requires just such a division of labor on the basis of fitness to fill special offices efficiently. There is the simple work to be done, and in civilized society there is the complex and intricate work to be done. In primitive society the simpler and cruder activities are of most importance, but in advanced society, while both the complex and the simple are necessary, the higher activities are of greater consequence, and the school must spare no pains to train up individuals who can perform them.

86. And it is plain that in a social organism of this sort all members ought not to receive just the same rewards for their labors. One who touches life in a broad way has more needs that must be ministered to than the one who bears fewer relations to men and things. A highly developed mind implies relatively great intellectual needs; it is opened up to phases of the world to which a different order of mind is closed. So the man of circumscribed, simple life has fewer æsthetic needs than the man of broad,

complex life; and the principle holds with respect to all needs whatsoever. So if the man living in a simple way because of the powers nature gave him receives the same rewards as the man dealing with more complex situations, there must be great injustice done to the latter individual. And a society which would institute such a *regime*, taking human nature as it is now constituted, would be speedily destroyed, for it would run counter to the first principles of the life of any organism by killing off, or at least not encouraging, its most efficient members.

§ 2. The Adjustment of the Different Classes.

87. How then would this principle affect the work of the school? It finds that there are industrial classes, to begin with, that live in a relatively simple way; the mechanic tending his machine deals with simple things compared with the president of the country, or a congressman, or a physician, or a teacher. And yet the mechanic is more than a tender of machines. He is a free citizen; he has a mind that seeks to comprehend the world that surrounds him; and besides he has social and æsthetic needs that are not supplied by the work he does. And his education ought to provide for these on account alike of the welfare of the individual himself and of the community in which he lives; for no man liveth to himself alone. If he is not educated on the social side he will suffer for it himself, and the society to which he is ill-adjusted will suffer also. Again, if he does not have some insight into the operation of the physical forces which play upon him his ignorance

will not only keep him from becoming adapted to his environments, but his superstitions will incite corresponding mental attitudes in others and prevent their adaptation. What I believe, that is to say, determines in part what my fellow believes; and the way I conduct myself influences my neighbor's behavior.

So every worker has relations and needs beyond the work which he does. But still these are, for certain classes, quite simple. The man at the forge does not need to comprehend the forces in the physical world in as thoroughgoing a way as does the engineer, or even the one who organized the shop and is responsible for its continuance. The man behind the counter does not need to comprehend human nature so profoundly as does the teacher or the lawyer or the minister. Again, those who live the simplest lives do not need to master the instruments of social communication in such a thorough and extensive way as do those who have the care of the more complex affairs of society. It may be said that every citizen ought to interest himself in the most complex as well as the simplest phases of social life, but such a view is founded upon sentiment and not upon any adequate conception of what social organization means and requires for its continuance. The statesman must have certain of his needs attended to by the blacksmith, and he cannot attempt to make himself master of all the details of the latter's work. The blacksmith, on the other hand, must have certain of his needs attended to by the statesman, and it ought not to be expected that he can ever grow to understand all the details of the work of the Solon.

88. Of course we encounter a great difficulty when we attempt to determine what will be adequate for the needs of any individual, whether he belong to the industrial or any other class. It is evident that we cannot settle this exactly in most instances, especially in a social organization like our own where class lines are not rigidly drawn, and where in individual cases they are easily broken down. We have our Abraham Lincolns, who are laborers at one period in their lives, and presidents at another period. But, after all, there are relatively few of these. It is possible to predict with considerable accuracy what kind of work, whether simple or complex, nine-tenths of the pupils in our elementary schools will do. The one-tenth is problematical. The conditions among us which contribute to determine how far a pupil will go in his development, and so what kind of work he will do, are partly financial, partly social in the narrow sense, and partly intellectual and temperamental. These conditions make it utterly impossible to work out an educational system wherein every pupil will be absolutely certain of getting the education which will prepare him best for his life-work; but this is precisely what we should expect. In a country like ours, where every one is struggling to "get to the top," it cannot be said just who will succeed. But we can be certain of one thing—a large part of our population must do relatively simple work, and the elementary school must care for their needs. To indicate just how this can best be done requires a separate volume, but it may be said here that it cannot be accomplished most successfully by attempting to carry pupils clear

through Shakespeare, and the spelling-book, and the arithmetic, and the grammar, while offering them nothing in real, vital history, literature within their grasp, nature study, music, and art. The pupil who will fill the simple offices in the social organism will have use for but very little of the last half of the arithmetic as it is presented in the text-books to-day. He could well dispense altogether with formal grammar; and if he can spell with absolute accuracy one thousand simple, familiar words he will never be in need. But he cannot possibly get too much of science which interprets the world in which he is placed, and history which makes him social-minded, in the language of the Committee of Seven, and literature which develops ethical impulses, and music and art which add to the pleasures of life as well as stimulate ethical conduct.

89. Then there are in every community the ruling and professional classes that have to deal with more complex problems than do the industrial people. They sustain all the relations to their fellows and to nature that the industrial classes do, and they bear other relations besides. The lawyer must go far beyond the laborer in his comprehension of the regulations which bind men together, and which must be considered in deciding the rights of any one individual as against his neighbor. The physician must master all that is known regarding disease and be able to apply this in the cases he is called upon to treat. So the teacher, the statesman, the minister must in the same way each become expert in a special direction, and the school must provide for this. And these have not only to make this elaborate

preparation for their special callings, but they are brought into more complex relations in every way with one another than is the mechanic, for instance, and so they must receive more thorough training outside of their specialties. A teacher bears more intricate and subtle relations toward his fellows than does the blacksmith; his action is more vital in its influence upon their well-being, and it is more important that he should be highly developed in ethical and civic faithfulness than that the blacksmith should be, although, of course, they should both be cultivated as fully as possible in this regard. The minister is brought into contact with phases of the social environment which the carpenter never encounters, and the school must recognize this. It must give the minister all that the blacksmith and the carpenter get, and much more besides.

90. So there are certain offices that all must be made ready to fill, and certain others that must be left to particular individuals or groups of individuals. The school will carry all along the same route for a way, and then those who are to deal with the simplest things will drop out into their life-work; others will go on until they, in turn, are fitted for the niche they are to occupy in the social structure. Of course, the further we can carry all along the better; the more fully they are prepared for adjustment to all phases of the world, the more they will be prospered themselves, and the greater benefit they will confer upon society. The ideal would be to keep all under the influence of the school during the entire developmental period, when the individual is in a plastic condition, and easily moulded after a given

pattern. As the situation is, though, we are not able to attain our ideal. The elementary school makes a beginning in the process of adjustment, but does not pretend to convey the individual in any particular up to the highest point which the race has reached. The high-school carries him still further along, gives him greater mastery of what the race has achieved, makes him comprehend more fully the necessity for social co-operation, and awakens in him impulses which lead him to shape his conduct more fully in conformity with the needs of social well-being.[1] The college carries him along from the point where the high-school leaves him, and continues to perfect his adjustment.

91. It is sometimes said that the high-school and the university ought not to be supported at public expense. It is maintained that the elementary school gives the pupil all that is essential for the making of a good citizen. Higher education is regarded as a luxury; reading, writing, and arithmetic are the sole requisites for good citizenship. But it is absurd to claim that a boy who stops at the eighth grade can serve society as well in its complex forms as can the high-school or university-trained boy. A society in which there is no body of persons more elaborately trained than the graduates of our grammar schools—

[1] I put aside for the present the question of whether the high-school as it exists among us really accomplishes these things in the most economical and effective manner. It *aims* to do this, and if it fails the fault lies in defective methods. It is possible that a merely formal psychology has resulted in giving us a merely formal high-school curriculum and methods of teaching; but we shall hear more of this later.

none that know physics or chemistry or biology any better, none that have learned the lessons of history any more thoroughly, none that have any greater power of mastering the intricacies of law or medicine or education — such a society must ever remain in a primitive condition. If our society should adopt such an educational *régime* it would speedily revert to a lower point in the scale of civilization. Any highly organized society must preserve itself from destruction, and must provide for continual progress by training up individuals who can become possessed of all that has been accomplished in special directions, and make additions thereto. Such training does not have in view individual pleasure and advantage, but social health and advancement. So we can see why society must for its own sake maintain the educational system from the kindergarten through the university.

CHAPTER VIII.

THE GENERAL EFFECT OF ADJUSTMENT ON TEACHING.

§ 1. The Relation of Adjustment to Other Aims.

92. When we regard Adjustment in this broad way, taking account of all those relations to the environment which are vital and not to be neglected without detriment to the individual, we see that as the aim of education it includes all that is best in the other aims that have been examined. These latter have been framed upon a partial view only of human nature, a view which comprehends but a single, and this in some cases not the most important, of man's relations to the world. It should need no argument here to show that if one becomes master of his environment in its social, intellectual, æsthetic and physical aspects his mind will be unfolded, in the way in which people who believe in Unfoldment as the end of educational effort commonly understand this term. Again, the individual who becomes adjusted will attain to complete Self-realization, for his reactions upon the world in the endeavor to master it will awaken all his dormant powers — perception, memory, reason, and imagination; love, hope, courage, honesty, and all the other attributes of

heart and head which should be brought to fruition in Self-realization. Those who advocate these aims would hardly say that all possible activities of the soul should be developed, but only those which are good, which are useful, which are virtuous. And why good, useful, virtuous? For the simple reason that they serve the purpose of correlating one with the world; of helping him to get on the better, and so, of course, of helping his brother to get on too.[1]

But the aim of Adjustment often guides us to the selection of different materials and methods of instruction from that of Unfoldment, or of Self-realization, in that it leads us to exercise perception, memory, and reason, and the emotional equipment of the soul with direct reference to the ways in which these will be employed in dealing with the situations outside of the school-room. But those who are led by these other aims would, if they were perfectly consistent, take no account of the circumstances under which, or the environments with reference to which, intellectual and emotional activity would be engaged in the later life of the individual. They would be satisfied if the attributes of the soul were called into being by any form of exercise. One may hear those who call themselves disciples of Froebel declare that the gifts have for their aim to awaken the divine inner life of the child, and not to give him knowledge of anything in the world, although this latter end may be accomplished incidentally. The teacher who makes use of these materials is not thinking about giving the child an understanding of, and

[1] Cf. Monroe, The Educational Ideal, p. 2.

so a mastery over, the world around him; her ambition is to "develop the selfhood," to "foster the image of God in the child," to "fan into flame the spark of Divinity in the young soul." And the formal, artificial gifts will serve this purpose best. For others than kindergartners it makes little difference in theory what materials are employed. Verbal memorizing and splitting hairs by logic, and philosophizing on the unknown and unknowable, would engage a pupil as profitably as anything he could do.[1] But adopting Adjustment as his aim one will always put the question to any material or method applying for favor in the training of the child, Are you well fitted to lead the learner into close correspondence with, and to give him control over, the world about him? He will not ask, Are you capable of unfolding the mind? because he knows if it will achieve the first end it will accomplish this last in the best way.

93. Again, Adjustment includes Discipline, but is still not identical with it. One must, of course, become possessed of a sharp, trusty mind if he is to be keen in estimating aright things in the world; and the keener his faculties are the more thoroughly will he be correlated with his environment. The forces

[1] "During this long period the dry formalism and dead conning of words which the standard of the church entailed, led, inevitably, to the dreary hootings of scholasticism. This owlish learning, growing more outrageous as its metaphysics became more absurdly deep, soon lost all point of contact with humanity. Its husks of syllogism drove all appetite for real learning from the mind of the student, and he contented himself, ignorant of better intellectual food, with a smattering of Latin, a jargon of philosophy."—Monroe, *The Educational Ideal*, p. 9.

which incessantly play upon one are extremely complex and involved, and unless he can separate them from one another, and see the way in which they operate singly and together; unless he can trace connections between phenomena that spring out of like causes and have similar effects—unless he can do these things reasonably well he cannot attain to anything like a high degree of perfection in his adaptations. One must have a disciplined mind, but disciplined with reference to the situations with which it must deal in maturity. Not all that is offered in an educational system founded upon Discipline[1] can be put to good use in dealing with the world, as we have had an opportunity to see in the effect upon conduct of the old Mediæval Trivium — grammar, rhetoric, and logic; and the Quadrivium—arithmetic, geometry, music, and astronomy. These curricula failed to produce in the real world of men and things that alertness and agility and faithfulness of intellect and that vigor of character for which they were so highly esteemed by the Disciplinarians. Todhunter gives expression[2] to a view which is endorsed by all psychologists in these times, and by others who have observed human nature even slightly, when he says that application to any subject makes men observant in that special field only. The study of botany prepares one to deal with botanical phenomena, and the study of chemistry with chemical phenomena; "but I have never noticed that the devotion to any specific branch of natural history or natural philos-

[1] See Tate, Philosophy of Education, for an exposition and illustration of such a *régime*.

[2] The Conflict of Studies, p. 23.

ophy has any potent influence in rendering the student especially alive to phenomena unconnected with the specific pursuit. I could give some striking examples to the contrary."

Those who place their faith in Discipline as the end of all training will put subjects in the curriculum, as they have done, that relate very remotely to any situations in which the pupil will be placed in maturity, but they urge that the value derived from mere formal study will be of service. Many a teacher keeps her pupils year after year on cube root, allegation, partial payments, and parsing, to "train their minds," to "teach them to reason," to "develop in them habits of attention." She causes them to learn all the words in the spelling-book, not because they will find them of service in after-life, but for the purpose of developing their memories.[1] But following our aim we would cut out every subject and all parts of subjects that were assigned a place in the curriculum simply because they "trained the mind." We would indeed train the mind, but we would train it with direct reference to the situations with which it would have to deal outside of school.[2]

94. It will not be necessary to argue the proposition that if we can reach the ends of Adjustment in our educational work we will obtain in some degree

[1] Excellent instances of this theory applied practically are seen in Aiken's System of Mind Training and Calkin's Object Lessons. Here materials are introduced into the school for the sole end of exercising the various mental faculties, and no claim is made that the materials themselves are of any account.

[2] The question of formal discipline in education is discussed in detail in Chapters XIII. and XIV.

what men have had in mind when they have made knowledge-getting the summum bonum of life; for accurate and abundant knowledge of any situation is, of course, essential that one may determine his conduct aright with reference to it. And knowledge includes not only what one gains from his own examination, but also what he gains from the examination of others. Our ancestors and our fellow-men have discovered certain truths regarding the world, and they have recorded and transmitted these for the benefit of their associates or their descendants. Then when these truths are mastered by the young they have the same effect on adjustment as if they had been discovered *de novo* by individual experiment. The individual participating in this way in the life of the race saves time and energy to an extent that we can probably scarcely comprehend, and of course it enables him to avoid pain and misery, and even summary extinction, by instructing him how to react to detrimental stimuli before they have a chance to do him harm. Past experience, alike in the life of the race and of the individual, is always a guide to future adjustment. It gives certainty and security to the first adjustments, and so makes possible the attainment of a vastly greater number of serviceable adaptations in any individual life than could otherwise be realized.

But still not everything that passes for learning can be counted as of use to all people, or perhaps to any person. It has already been shown that ideas are potent in guiding action only when the environment is propitious for their operation. If what one learns does not relate to the things to be dealt with,

how can it instruct him regarding his behavior toward them? When the school causes the pupil to learn, for the sake of the learning, words that he will never employ in expressing his own thought or participating in the thought and life of others; when it causes him to spend his time and energy over grammatical and rhetorical technicalities and arithmetical puzzles and anatomical minutiæ and historical trivialities, none of which relate to any of the vital situations in which he is placed in life—when the school does this what does its instruction avail in human life? In fine, if the knowledge one gains bears *directly* and *obviously* upon any of the problems which an individual meets in trying to master the world it must be regarded as advancing adjustment in an effective manner, but otherwise it can influence conduct but little, and so must be discarded as not worth while. Bishop Spalding has emphasized this conception, in spirit if not in terminology, in the distinction he makes between learning and knowledge;[1] the latter is organized into conduct, while the former is apt to be simply formal, external, lifeless. But surely knowledge may be so gained that it will be vital, fruitful in its effect upon one's demeanor; this, though, is a problem of method which must be examined at length in the appropriate place.

[1] "Learning is acquaintance with what others have felt, thought, and done; knowledge is the result of what we ourselves have felt, thought, and done. Hence a man knows best what he has taught himself; what personal contact with God, with man, and with Nature has made his own. The important thing, then, is not so much to know the thoughts and loves of others, as to be able ourselves to think truly, and to love nobly."—*Education and the Higher Life*, pp. 30, 31.

95. It may be noticed, finally, that if one is rightly adjusted to the world he will be able to earn his daily bread, which many regard as the great end to be aimed at in education. He will be of service in some way to his fellows, and they will supply many of his needs in return for what he does for them. One cannot think of a person being adjusted harmoniously to his environments who is idle and unproductive; who lives upon the skill and toil of others without contributing anything himself to the prosperity of the social body. It is not necessary, of course, that each individual should produce material goods, but if he does not do this, then he must at least add to the things of spiritual value which those who provide for his physical needs may enjoy. No member of the community is so ill-adjusted as he who, while having his comrades supply him with food and drink and shelter, is unable or unwilling to return them full value received either in perfecting their social adaptations, or in revealing to them more clearly the mechanism of the universe, or some portion thereof; or, in short, who does not increase in one way or another the sum of things which promote the happiness of his associates.

96. We have now reached the point where we can see that the most important distinction between the aim of Adjustment and the others which have been reviewed is that the former is always dynamic, always vital, always comprehensive, while the latter are to a greater or less degree static, formal, partial. Adjustment seeks ever to give the individual mastery over those phases of the environment that he must understand in order to realize most fully the possibilities

of his being. And it aims to lead society as a whole to a mastery of the world in its totality so that in reality each member thus becomes adjusted to all features of his environments. One who is guided by this aim will plan his educational system in view of the environments that are to be adjusted to. He will get the child, as Aristotle advised long ago, to doing in the school what he will be required to do outside. What the Committee of Seven has to say [1] respecting instruction in history and kindred subjects may be said of every study pursued in the schools, when regarded from the standpoint of Adjustment,— "recent psychological pedagogy looks upon the child as a reacting organism, and declares he should be trained in those reactions which he will need most as an adult. The chief object of every experienced teacher is to get pupils to think properly after the method adopted in his particular line of work; not an accumulation of information, but the habit of correct thinking, is the supreme result of good teaching in every branch of instruction. All this simply means that the student who is taught to consider political subjects in school, who is led to look at matters historically, has some mental equipment for a comprehension of the political and social problems that will confront him in every-day life, and has received practical preparation for social adaptation and for forceful participation in civic activities."

But those who measure their teaching by the standards of discipline or of knowledge-getting are usually content with no other reaction upon what

[1] History in Schools, pp. 17, 18.

they present than mere verbal repetition. The conception of mind upon which these aims are founded leads the educator astray when he constructs his educational philosophy to harmonize with it. This conception makes mental activity an end in itself; it does not occur for a purpose—for the acquisition of objects of value to the organism. But we are coming to see that mind develops in the measure that it is used in the attainment of ends outside of itself, and it functions normally only in response to such an incentive.[1] Morgan presents[2] a principle of psychology relating to motor activities which applies equally well to mental activities. "We must notice," he says, "that the activities themselves over which control is exercised do not, as a rule, occupy the focus of consciousness at the moment of control; it is rather the end to be gained, or the result to be avoided, to which we attend. When the child stretches forth his hand to seize the sweet, it is the sweet itself which is in the focus of consciousness."

Education based on the doctrine of formal discipline puts the pupil in a seat and limits his sphere of adaptation to a book, while Adjustment either takes him into the world or brings the world, so far as possible, in to him, using the book only when it reinstates, although in a new setting, some experience which the child has already had. It is surely not mere fancy nor prejudice to say that the clear recognition of this aim, and its embodiment in practice, will do for the teacher what evolution has done for the

[1] Cf. Luqueer, Hegel as Educator, p. 110.

[2] Psychology for Teachers, pp. 63–64. Cf. Baldwin, Mental Development, Methods and Processes, pp. 189, 294.

philosopher and thinker—it will open up to him a world of real, substantial, and not simply verbal and formal values. Much of our education is scholastic, academic, bookish; we need a Goethe or a Heine to summon in commanding terms schoolmen out into the open air to refresh their souls with the beauty and reality of things. They have been too much concerned with symbols, with the forms of truth, which have made them mere "gerund grinders," to use Carlyle's phrase, and it is to be regretted that he did not devote a whole Sartor Resartus to their foibles and weaknesses.

97. Men of Fouillee's mode of thinking[1] talk as though it were possible to develop courage, obedience, honesty, purity, promptness in action, and similar virtues *in abstracto*, as it were. Virtue is a kind of thing-in-itself to such people; virtuous *deeds* only obscure the reality, and are not essential to it. To develop courage then you need not act courageously; you need not be brave in the situations in which you are placed in daily life. And again, a virtue is something above and beyond what is involved in getting on in the world in the right way. One might never perform a courageous act and still be courageous; he might be honest without revealing it externally, so to speak. There is a kind of essence of virtue which is superior to the exigencies of every-day life, and this is what the school must stimulate. But how? Does not honesty imply an environment upon which one can react in an honest manner?—an environment of men and women hav-

[1] See his Education from a National Standpoint.

ing vital relations to the truth-teller—striving to obtain goods which all equally desire? No, virtue is but the quality of *deeds;* an actionless thing cannot be virtuous. Virtue denotes the conditions of human action which are essential for the most perfect adaptation—just this and nothing more.

98. Our aim, then, makes the educational process in all its details purposeful and definite. Take, for instance, such a simple and usually formal thing as training the voice to be employed in song. The question arises at once, what part is it to play in adjustment? and what is essential in order to achieve this end? The answer comes immediately, "The voice must be made pleasing to people; it must give them pleasure, and they will remember the singer and reward him in the measure that he gives." In criticising the voice the criterion of success or failure will always relate to its effect upon the singer's audience. There will be an end to reach beyond the attainment of certain tone effects, as though their mere production was the aim of all effort. It is a striking fact that no activity seems to become easy and effective except when the actor has some goal to reach, and the whole organism, physical and mental, co-ordinates harmoniously to accomplish the task. Let the pupil once see the function of spelling and reading and number and Latin and geometry in correlating him with the world, and this will be the best incentive to him to become possessed of the power which they severally give.

99. But we shall probably never be through with hearing that the old system was the best; that it

made men superior to those of to-day.[1] Doubtless the worth of the old-time district school should be highly estimated; but yet we must not forget that distance always lends enchantment to the view, and fortunately perhaps we never weary of recounting the virtues of the system of things that begat us. There is in the breasts of all of us, too, a deep reverence for what our ancestors did, which makes it impossible to see the achievements and merits of the past and the present in right relations. But when an unbiased man, trained in historical method, looks over the past and compares it with the work of to-day, founded in a measure upon more vital principles, the times past do not seem so glorified. In those days "there was much study, provided only the student had ability and ambition, and could get enough incidental help at home and in school to set him on his feet; but there was little teaching. On the whole one is rather surprised that the pupils learned as much as they did learn. It may be confessed, in fact, that some of them did exceptionally well. Those who had strong intellects and determined wills, being thrown upon their own resources, developed their reserve strength and became independent students. But it is pathetic, even at this distance of time, to recall the boys and girls who never learned how to study and never got beyond the merest rudiments of an education. Some of them never even learned to read with much intelligence, and as for arithmetic, which was the leading study, they ac-

[1] See as a type of much writing in these times, Briggs: Atlantic Monthly, Oct., 1900; and Munsterberg: Atlantic Monthly, May, 1900.

quired little more than the elementary operations and were by no means proficient in them. The old district school was of great value, but in studying this chapter of educational history the student must not allow himself to be misled by the sentiment that has grown up around the 'little red school-house.'" [1]

§ 2. Adjustment and Interest.

100. These thoughts suggest a further characteristic which distinguishes our aim from others. When discipline or culture is made the end of training it is of no great moment whether the pupil be interested in the materials employed or not; indeed there are those in our day who think more will be accomplished by coercing a pupil through his studies, in the teeth, as it were, of his desires and inclinations. George Eliot has given us in Mr. Stelling [2] a portrait of such a disciplinarian. When Tom Tulliver expressed his hatred of Latin Grammar, which had no significance whatever for him, his teacher forthwith concluded that that was just what he ought to have in the largest doses. Teachers who have placed their faith in Discipline as the end of educational endeavor have had to rely largely upon the rod to get their pupils to perform their daily tasks; "schoolmaster" has in some times and places been synonymous with "thrasher" or "flogger." Squeers is perhaps a little

[1] Hinsdale, The Art of Study, pp. 51–53. Colonel Parker is reported to have said in speaking of the olden-time school—"Yes, it saved some, but think of the number that were lost!"

[2] In the Mill on the Floss.

overdrawn in the severity of his discipline, but if our poets and novelists are to be relied upon his type has been reproduced in the great majority of pedagogues,[1] and this has led many generations of boys and girls to creep unwillingly to school, and to cease even the creeping whenever a fortunate opportunity presented itself to do something more real, more significant, more interesting.[2] How many have testi-

[1] "Grave is the master's look, his forehead wears
Thick rows of wrinkles, prints of worrying cares;
Uneasy lie the heads of all that rule,
His worst of all whose kingdom is a school.
Supreme he sits: before the awful frown
That binds his brow the boldest eye goes down;
Not more submissive Israel heard and saw
At Sinai's foot the giver of the law."
—Holmes, *School Boy.*

The spirit of the times is reflected in Byron's injunction to the schoolmasters,

"O ye who teach the ingenious youth of nations,
Holland, France, England, Germany, or Spain,
I pray ye flog them upon all occasions;
It mends their morals, never mind the pain."

In "the Greater Dunciad" we have a favorite picture of a school tyrant, one that is not seldom used in our day with which to frighten the young:

"When lo! a specter rose, whose indexed hand
Held forth the virtue of the dreadful wand;
His beavered brow the birchen garland wears,
Dropping with infants' blood, and mothers' tears.
O'er every vein a shuddering horror runs,
Eton and Winton shake through all their sons."

[2] A modern poet, in one of our popular magazines, thus voices

fied regarding their school experiences as Mill does:[1]

the protest of the young of our own day against the still too cold and formal life of the school.

School Begins.

Wow!
Ten million "Wows!"
Or more,
Rise o'er the land.
Oh youngsters,
You're up against it, sure;
You know the gall
Of government
Without the consent of the governed.
And we tender you
Our earnest sympathy
September is a slop,
That's what it is,
Or it would loose the key
To lock the fetters on your limbs
And give your brains
A chance to boom.
What's brains to you
When all you want is room and time
To let your bodies have full sway?
The grown-up folks may feel the need
Of books and brains—
Your work and world and wisdom
Call for different stuff.
If it were so
That two times two were hop-scotch,
And two into eight went fishing,
Or d-o-g spelled "I spy,"
Or Geography were a description
Of the earth's swimming holes,
Or Grammar were the study of the parts
Of a boat,
How much more gladly would you seek
True wisdom
In the school-house walls.
Or if the young idea were taught to shoot
With a shotgun,
How silently you'd "Wow!"
When sad September
Shoved you into school.
The grown folks ought to go to school
Because they do not like to play,
And you, who do
Should be let run
Until you, too, have grown beyond
The playing age
To find the need
Of what is taught in school—
Ain't that so?

[1] Autobiography, pp. 136, 137.

Wayland thus describes the method of the teacher of forty

"I had always heard it maintained by my father, and was myself convinced, that the object of education should be to form the strongest possible associations of the salutary class; associations of pleasure with all things beneficial to the great whole, and of pain with all things hurtful to it. This doctrine appears inexpugnable; but it now seemed to me, on retrospect, that my teachers had occupied themselves but superficially with the means of forming and keeping up these salutary associations. They seemed to have trusted altogether to the old familiar instruments, praise and blame, reward and punishment. Now I did not doubt that by these means, begun

years ago who thought the school existed to discipline its students: "He used but one motive to obedience—terror. The ferule and the cowhide were in constant use. He never taught us anything; indeed he seemed to think it below his dignity. I do not remember anything approaching explanation while I was at the school. A sum was set, and the pupil left to himself to find out the method of doing it. If it was wrong, the error was marked, and he must try again. If again it was wrong, he was imprisoned after school, or he was whipped.

"In other studies the text of the book must be repeated without a word of explanation. Geography was studied without a map, by the use of a perfectly dry compendium. I had no idea what was meant by bounding a country, though I daily repeated the boundaries at recitation. I studied English grammar in the same way. I had a good memory, and could repeat the grammar (Lowth's I think) throughout. What it was about, I had not the least conception. Once the schoolmaster was visiting at my father's, and I was called upon to show my proficiency in this branch of learning. I surprised my friends by my ability to begin at the commencement and to proceed as far as was desired; yet it did not convey to me a single idea."—A Memoir of the Life and Labors of Francis and H. L. Wayland, Vol. I., pp. 24, 25.

early, and applied unremittingly, intense associations of pain and pleasure, especially of pain, might be created, and might produce desires and aversions capable of lasting undiminished to the end of life. But there must always be something artificial and casual in the associations thus produced. The pains and pleasures thus forcibly associated with things, are not connected with them by any natural tie."

101. But life is serious, life is earnest, say some, and the best preparation for it is the performance of disagreeable tasks throughout childhood. What our schools should cultivate is not a lively interest in the world of man and nature, but that moral sinew which is developed alone by struggling with obstacles, no matter what these may be, only so that they be difficult to overcome. The end of the struggling is not to attain something of value; it is a dead struggle for the sake simply of struggling. It is battering down a stone wall beyond which lies nothing but vacancy. Suppose this to be the right method of developing human character—coercion to the performance of uninteresting tasks; how could the race ever have been evolved when there was no coercion except such as originated within as an impulse to know the world and to get into harmony with it? Is it too much to say that one will always be interested in anything, can always attend to it, when it is seen to bear upon his adaptations to situations which in some way affect his well-being? This means simply that nature has implanted in every person a profound desire to learn about the things with which he has relationships, and the outward manifestation of this is called interest. When it is necessary to apply

coercion, though, it indicates that the meaning of things, if they have any, is not discerned. As McLellan and Dewey have said,[1] whenever we have to appeal to external stimulus to get one interested in a subject it shows that the activity tends constantly to cease; the mind inclines to wander or becomes listless. This "means that there is no intrinsic value, no spontaneous movement, no self-developing energy in the mind."

Interest will not be confounded, of course, with whim or caprice or humor or freak; it is not temporary or fanciful. "The theory of interest does not propose to banish drudgery, but only to make drudgery tolerable by giving it a meaning. We have seen that what is interesting is by no means necessarily pleasant; but it is something that impels us to exertion."[2] Interest expresses the attitude of the organism toward the environing world which is believed to offer possibilities of pleasure and pain, and acquaintance with it is deemed to be highly desirable. Interest is the signboard pointing the direction in which education must proceed. When the mind deals with things in which it is interested all its activities are energized; it grows keen, alert, vigorous. Tasks performed with interest do not fatigue one as readily as those one hates, though they may be far more severe. In Shakespeare's words, "No profit grows where is no pleasure ta'en."

102. Donaldson has pointed out[3] that, regarded from

[1] The Psychology of Number, p. 87.

[2] Adams: Herbartian Psychology Applied to Education, pp. 262, 263.

[3] Growth of the Brain, chapter on "Education of the Central

the neurological standpoint, interest in things is the necessary condition for the best development of cerebral areas, and for uniting them into an organic whole. He suggests, too, that this interest would have a better organizing effect if it was secured in a natural rather than in an artificial way by means of gold and the cane. The effort involved in always doing what one hates results in arrest of cerebral development, if in nothing worse. On the psychological side this results in a division of attention, and consequently in a hindrance to the unification of the moral and intellectual life.[1] "A long course of drudgery in school," says Adams,[2] "will no doubt so break a boy's spirit as to make him unfit to be anything in the world but a drudge. So long as a boy's spirit remains, a course of drudgery leads only to a wild desire to get free from it. This educational homœopathy stands self-condemned. On the other hand, give a boy sufficient interest in anything, and we have seen that all the attendant drudgery is cheerfully faced." And this seems simple enough when we discern the relation

Nervous System." Carpenter has discussed the general subject from the same point of view, and a few of his words may be quoted: "Those 'strong-minded' teachers who object to these modes of 'making things pleasant,' as an unworthy and undesirable 'weakness,' are ignorant that, in this stage of the child-mind, the will—that is, the power of self-control—is weak; and that the primary object of education is to encourage and strengthen, not to repress, that power."—*Principles of Mental Physiology*, p. 134.

[1] See also Dewey, Second Supplement to the Herbartian Year-book, 1895, p. 214.

[2] *Op. cit.*, pp. 266, 267. See also McMurry, General Method, chap. 3.

between interest and adjustment, and how necessary it was in order to secure adaptation at all that some great inciting force should have been instituted as a *vis a fronte* to incite one's activities and to compel attention.

PART III.

THE METHOD OF ATTAINING ADJUSTMENT.

CHAPTER IX.

THE ORGANIZATION OF THE SIMPLEST REACTION-SYSTEMS.

§ 1. Instinct.

103. In order that even so much as a start may be made in adjustment, it is essential, of course, that an individual should react in some manner to the stimuli which play upon him. He must take some sort of an attitude toward every situation in which he finds himself. But what determines the outcome of any given stimulation? Is the route definitely marked out, or is it a matter of chance what reaction any particular stimulus will produce? Will certain situations invariably call forth definite reactions in all people? Seemingly so. A bright object will uniformly arouse the grabbing response in a young child, while he will as certainly shrink away from strange faces and voices and animals. Touch an infant's lips with your finger and he will respond

with a sucking movement; and this is typical of other reactions occurring in infancy before they could be learned by individual experience. The explanation of these phenomena is simple enough, of course. In the light of modern evolutionary thought these reactions are seen to have been serviceable to the race and so they have been conserved, because the creatures that performed them had an advantage in the struggle for existence.[1] So the child makes a start in life with a more or less complex machinery for producing reactions already set up and in working order, which means simply that there are many serviceable activities, and some of the opposite sort, too, which the individual does not have to acquire. The race has developed them for him. And it is not difficult to see the usefulness of instinct in human life, for an adjustment once made, whether positively in securing ends of advantage, or negatively in avoiding harmful experiences, ought to be ever repeated, not only in the life of the discoverer, but in the lives of all his descendants.[2]

104. The essential quality of instinct is that it gives the child, without having to learn it, the

[1] The literature of evolution deals generously with this subject, but one not familiar with it will find the following particularly helpful: Groos, *op. cit.*, both volumes; Lloyd Morgan, Habit and Instinct, and Animal Behaviour; Romanes, Mental Evolution in Animals; Baldwin, Story of the Mind, Chap. III; all the volumes of the *Pedagogical Seminary*.

[2] Of course, when the evironmental conditions change an instinct may cease to be of value, and it may even be a detriment to its possessor, as it not infrequently is in animal life; but taken as a whole the plan works well, and nature seems to consider it best not to modify the instinctive equipment of an animal as rapidly as its environment changes often.

ability to react to given situations as his ancestors have done and have found helpful. Without doubt this plan of repetition of a reaction under given circumstances is pursued in a general way in all adjustment, even that which the individual must learn by his own experience. Nature says, alike to the child and to the man, "Conduct yourself in a present situation as you have behaved in the same or similar situations heretofore, and have found the result to be to your liking." It seems probable that the whole mental equipment of man, as well as of lower forms of life, has been fashioned with reference to the carrying out of this plan. The detailed mental processes involved in adjustment which we are about to investigate may be seen in the larger view to all be concerned in getting at the gist of any matter in hand, and considering what in all of previous experience this unknown thing is most like, so that it may be understood in the light of wisdom gained on former occasions. To gain a comprehension of the untried, and so really the unknown things in the world, through what has already been made intelligible as a result of one's experience—this may be the motif of all intellectual activity.

§ 2. The First Step in Learning.

105. Every one knows that in the very beginning an infant is capable of performing only a few relatively simple instinctive activities, such as sucking, crying, carrying his hand to his mouth, and the like. His response to the world seems to be purely reflex. But if we follow him along we find that by the fifth week, possibly earlier, he apparently begins to be

aware of things about him. The eye seemingly takes cognizance of light, and the ear of sound.[1] This is the preliminary stage in getting acquainted with the world; but there is really little if any adaptation as the result of this experience. The week's old child simply stares at his mother's face;[2] the color scheme there presented seems to mean nothing to him. It is neither beautiful nor ugly, neither good nor bad, neither kindly nor cruel. But how can we tell? By the child's outward manifestations simply; by the way in which he conducts himself toward the object. There is no visible response yet to the stimulations, although in the case of hearing, for instance, loud noises will produce manifestations of fear, and in the case of taste, sugar placed in the mouth will in-

[1] As early as the tenth day the child will fixate a candle or other bright object, but this is undoubtedly reflexive; the cerebral cortex is probably not involved in this act, and there can be no consciousness in it. The occipital cortex is not ready for functioning before the fourth or fifth week, and the auditory cortex "ripens" later than this. So the infant's reactions upon visual and auditory stimuli before this time must be regarded as reflexes pure and simple.

[2] What is said here regarding the way in which the child learns the world is based largely upon my own observations; but the reader is referred to Preyer's The Mind of the Child, two volumes; Miss Shinn's Notes on the Development of a Child; Mrs. Hall's The First Five Hundred Days of a Child's Life, Child Study Monthly, Vol. II., pp. 330 *et seq.*; 394 *et seq.*; 458 *et seq.*; 522 *et seq.*; 586 *et seq.*; 650 *et seq.*; Mrs. Moore's The Development of a Child, Psychological Review, Monograph Supplement, No. 3, Oct. 1896. Tracy (The Psychology of Childhood) gathers up and classifies the results of observations by many people, and while there are some differences in details there really are none in respect of the principles of learning presented in these pages.

cite swallowing movements. But these should doubtless be regarded as reflex responses pure and simple. Somewhat later, visual stimulations will often incite fear responses, but these too are unquestionably made possible by racial experience and not by individual learning. At first, then, the eye gives nothing of any *significance* so far as it is possible to determine from observation of the child's behavior when he is fixating objects. When he sees his mother he does not struggle to reach her, as he is certain to do on similar occasions later. He does not, in short, react in a way which will indicate to us that what the eye reports has import of any sort. So, too, the mother's voice might as well fall on ears stone deaf, for it awakens no adaptive response in the infant, except it have a note of terror in it. Once more, the tactile sense of a child a week old is no guide to him in a true sense respecting his behavior toward things—has no other result upon adaptation than to set off instinctive reactions,[1] and most

[1] Professor W. C. Bagley commenting upon this sentence in MS. says: "The touch areas are medullated, and hence (by *theory*) functionally mature shortly before birth. Theoretically there is no neurologic reason why the first glimmerings of consciousness should not be present at birth—a crude unorganized touch-kinæsthetic-somatic consciousness, but consciousness nevertheless."

But even if consciousness is involved in tactile experience in a day's old child, it would still be true that the content of consciousness could contain nothing more than pleasure and pain elements caused by the immediate experience. There could be no comprehension of the object occasioning the experience other than that it was now either agreeable or disagreeable, and the adaptive reaction would certainly be instinctive. The child has made no connections between particular tactile ex-

of these, so far as they appear purposeful, seem to relate either immediately or remotely to the conveyance of things to the mouth.

106. But before the expiration of the sixth month in most cases the mother's face exerts a very marked influence upon the child's behavior. He now struggles to be taken by his mother when he sees her, and this is good evidence of learning in the true sense—of ascertaining how to conduct one's self toward things. The method of accomplishing this is, no doubt, familiar to every one. The mother has been ministering to the child's needs, and so giving him much pleasure; and of course he will wish to have all pleasurable experiences frequently repeated. And while he has been enjoying these experiences he has at the same time been giving visual attention to his mother's face, and auditory attention to her voice. Day after day for several months these elementary impressions—visual, auditory, kinæsthetic, somatic—have been gained simultaneously, with the result that they get connected together into a rather complex system, to which have been added motor data relating to the process of reaction upon these stimulations. Now these organic stimulations are so agreeable that the child wants them repeated as often as possible, and so the information given him through vision becomes a means of bringing about a renewal of his pleasure. In the past these particular visual data, these certain color values belonged to the source of the pleasure-giving experiences, and now when this color scheme is presented again the *source*

periences and particular adaptive motor processes as a result of his own experiments.

thereof must be within hailing distance, and an effort must be made to establish organic connections with it,[1] employing the means which have before been successful—great vocal and bodily demonstration.

Of course this reaction must be at least partly instinctive. We must suppose that the child inherits a tendency at any rate to react in certain ways upon certain visual stimulations—seeking to get tactile and gustatory sensations from brightly colored objects, for example. But still experience comes soon to play a part in determining reaction; by the fifth month the child will conduct himself differently toward his mother, and other persons that resemble her quite closely. Here instinctive tendency is modified by experience; and when this first appears the child is at the very dawn of learning. He begins to comprehend the *meaning* of what he sees and hears, a meaning which enables him to take toward things an attitude that will, generally speaking, promote his welfare. It is, of course, not difficult to see what this learning process consists in—the organization into a more or less complex reaction-system of sensory and motor elements that have heretofore not been connected at all.[2] In popular phraseology it is the association of the information gained through one sense with that gained through others, and the association of all with adaptive motor activities.

[1] This point is worked out in some detail in Chapter X.

[2] All reaction-systems established before the child has had experience with the situations to which they relate are, of course, reflex or instinctive; they can in no sense be regarded as the products of learning.

107. The term "association," however, as popularly used, does not seem to denote with sufficient definiteness and certainty the dynamogenic outcome of the coupling up of these elementary factors. It suggests to many simply a fastening together of impressions that have been gained simultaneously or consecutively, yielding a perfectly static combination. But the objective point of all association of sensory impressions, in the beginning at any rate, is, speaking neurologically, the motor centres; or speaking psychologically, it is always conduct, behavior. Learning thus implies, in this first stage, organization of sense impressions the better to guide reaction. As a result of such organization data about a situation coming in through one avenue, as vision, will often give as complete knowledge of the situation for purposes of deciding how to react upon it as could be obtained by getting additional information through other avenues, as taste, touch, and the like. This point is illustrated finely in the child's learning about his food. At first when he looks upon it it is nothing but color to him, and so has no significance, for he does not see in it any possibilities of ministering to his needs. By the seventh or eighth month, though, when he *sees* his food he struggles to get it, and so he has learned to tell without actually tasting how this thing will taste. Of course this acquisition has greatly extended his sphere of adjustment, for he is much more likely now to secure enough food, and to avoid disagreeable or harmful experiences. His tasting power has been projected, in a certain practical sense, out into regions remote from gustatory exploration.

108. It is a fact of first importance for a philosophy of learning that by the completion of the first year almost everything with which the child has experience, and from which he receives visual or auditory stimuli produces some sort of reaction in him. The business of organizing impressions, and establishing reaction-systems thereupon, has gone forward with marvellous rapidity, which has been made possible, no doubt, by native tendencies, more or less definite, to react in characteristic ways in particular situations. Of course, the possibilities of learning with reference to any object, no matter how simple, are probably never fully exhausted; and yet the thing may be known in part, at any rate. Observe the child getting acquainted with his mother, for instance. For a time all that he knows about her is that if she will take him in her arms she will give him pleasure. But with increase of experience this general knowledge is broken up into particular knowledges, and characteristics of the mother are discerned that were overlooked in the early months of learning. As the child develops there gradually awakens within him attributes which make it possible for him to respond to similar qualities in the mother, and his senses grow sharper to detect the evidences of these. When he is capable of appreciating nothing but the effects of immediate organic contact with his mother his eye does not need to apprise him of anything about her but her presence simply. As he develops, though, many different reactions are set up by the mother's presence, while only one was observable at the start. It is probable that the individual keeps on adjusting himself to his mother in new ways until

maturity is reached. It is very late before he discerns what we call her spiritual qualities, and conducts himself toward her accordingly.

109. We have seen, then, that in the very beginning of the child's learning the world he gains nothing but isolated sense impressions about it; and whatever reactions he makes upon it are purely instinctive. This is what may not inappropriately be termed the sensational period in the learner's career, employing the term current in psychology. Soon the child makes a start in arranging these impressions in the patterns in which they are presented by the objects to which they belong; and this may be styled the perceptional[1] period, which, like the sensational period, is of course never entirely completed. It is legitimate to consider them as periods only because certain types of activities are especially prominent at these times. It seems proper to remark here that in an older day it was maintained that the mind from the beginning apprehended the *whole* of anything which was acted upon by the senses. The infant appreciated the form, size, taste, and all the other attributes of an apple the first time he looked at it, for instance. But modern psychology holds that the percept is built up gradually through the coordinating of simpler elements. It is the product of organization of factors originally independent. It is a complex which in any individual case is constantly

[1] Psychologists do not all mean precisely the same thing in the use of the terms *sensation* and *perception*. Cf. the following: Wundt, Grundzüge d. physiol. Psychol.; Stout, Analyt. Psych., Vol. II., pp. 30 *et seq.;* James, Princ. of Psych., Chap. XIX.; Titchener, An Outline of Psychology, pp. 148–188; Ward, *op. cit.*

changing with increased experience. Vision contributes some elements of the complex, while taste, touch, the muscular sense, and so on, furnish others.

It used to be thought that vision could unaided reveal to one all the qualities of the world, including spacial relations, but we know better to-day. Genetic psychology has given us a view of the percept in the process of making, and pathology has shown the effects upon percepts of some inactive sense. The famous Cheseldean case illustrates the principle; "When he first saw, he was so far from making any judgment about distance, that he thought all objects whatever touched his eyes (as he expressed it) as what he felt did his skin, and thought no objects so agreeable as those which were smooth and regular. He knew not the shape of anything nor any one thing from another, however different in shape or magnitude. Having often forgot which was the cat and which was the dog, he was ashamed to ask; but catching the cat (which he knew by feeling), he was observed to look at her steadfastly, and then, setting her down, said, 'So, puss, I shall know you next time.' . . . We thought he soon knew what pictures represented which were shown to him, but we found afterward we were mistaken, for about two months after he was couched he discovered at once they represented solid bodies, when to that time he considered them only as parti-colored planes or surfaces diversified with variety of paint; but even then he was no less surprised, expecting the pictures would feel like the things they represented, and was amazed when he found those parts which by their light and shadow appeared now round and uneven

felt only flat like the rest, and asked which was the lying sense, feeling or seeing."[1]

Baldwin has pointed out[2] that the motor elements which the older psychology took little or no account of are also of vast consequence in the building of the percept, and constitute an integral part of the complex whole. If they be lacking or destroyed, there can be no process of true perception probably. "The motor contribution to each presented object," he says, "is just beginning to be recognized in cases of disease called by the general term *apraxia, i.e.*, loss of the sense of use, function, utility, of objects. A knife is no longer recognized by these patients as a knife, because the patient does not know *how to use it*, or what its purpose is. The complex system of elements is still there to the eye, all together; the knife is a thing that looks, feels, etc., so and so. This is accomplished by the simple contiguous association of these elements, which has become hardened into nervous habit. But the central link by which the object is made complete—by which, that is, these different elements were originally reproduced together by being imitated together in a single *act*—this has fallen away."

110. What sort, or perhaps degree, of adjustment does this kind of learning give the child? Plainly it confers upon him the power to adapt himself to individual things in the world. He organizes his sensory data and motor reactions with regard to particular individuals—particular apples, men, dogs, and the like—with the result that he does not get his apple

[1] Preyer, The Development of the Intellect, pp. 287, 288.
[2] Mental Development, pp. 311, 312.

data and his dog reactions coupled up together, but makes them run straight, each in its right groove, so that the dog reactions will never be set off by the form or color or smell or feeling of an apple. Of course, systems whose sensory elements are much alike, as the apple and lemon, or cat and dog, or snow and cotton, are sometimes mixed, and the child gets into trouble—a phenomenon which will receive the attention it deserves in another place. But what the learning process seeks to accomplish is to get the color and taste and touch and muscular sensations derived from experiment with any particular thing established in certain definite channels of motor discharge which will bring the child into appropriate relations with the thing; and then when some one sensory element of this complex system is revived it tends to reinstate just the right total process and no other; and in this way the individual secures adjustment.

§ 3. The Learning of Individuals and Classes.

111. But while the child is learning the individual he is simultaneously learning the group to which it belongs. Baldwin says that the child reacts to the group first, and comes last to the individual, while psychologists have generally held that learning proceeds from what is particular in any field to what is more general in that field. But in both these views too great distinction is made between the group and the individual in the first stages of learning; the distinction is logical rather than psychological. When the child has reacted in a certain way to a particular apple he will react in the same way in the future to all apples

presenting characteristics or signs like this first one. All other apples are but repetitions of the first; or they are but the same individual repeated, for all practical purposes. Viewed from within, from the reaction standpoint, there is no class; there are just individuals to be dealt with as they have been dealt with previously. In another view there are no individuals; it is the same thing every time, and must be reacted to in the same way. In still a different view there are groups of individuals that, while not identical, yet closely resemble one another, and they must be reacted to in *substantially* the same way. Of course, as the child's experience with apples increases he gradually breaks up the apple world into grand divisions, and even subdivisions, according as particular portions have special significance for him. For example, Russets are catalogued by themselves, and Baldwins by themselves, and Greenings by themselves, because these have to be adjusted to in somewhat different ways. An organism that is affected unpleasantly by sour apples must learn the signs of sourness, and pass by the objects that will yield it. And the principle here illustrated is at the bottom of all learning to discriminate individuals.

112. Whether any one member of a group will be reacted to in a special way, then—will be learned as an individual, that is to say—depends upon whether it affects the learner in a particular manner, so that he should react to it in a peculiar way. But there are many things so very much like other things that it is of no importance to single them out from each other, since they may all be reacted to in the same manner. This is true of the child's method of deal-

ing with apples, for instance, during the first years of life, and it is doubtless the case with many people throughout their lives. For practically all persons, except the farmer and the merchant, there is little need for discriminating in any detailed way the varieties of apples. The apple qualities common to all varieties are alone of much importance to us, and we pass over the individual peculiarities. But for the apple-dealer there are subdivisions of subdivisions. There are not only Baldwins and Russets and the other large classes, but there are in any one of these the good-keepers, the headers, the cider-makers, the good-eaters, and so on. But even the farmer does not get down to the *individual* in any absolute sense; he simply limits the extent of his groups.

113. It is clear enough that the child is much more likely to discriminate individuals in respect of some sorts of things than of others, for the reason that certain things are relatively very complex, and his relations to them are varied and intricate, and individual characteristics need to be apprehended, because they are of vital consequence in adjustment. This is especially true of people. The child's father, mother, teacher, minister, and playmates, each influences him in peculiar ways. They have particular qualities which demand particular kinds of conduct on his part, and he must not get these individuals confused or he will suffer for his carelessness, if not positively then at least negatively, in failing to obtain some privilege or receive some favor. Again, all increase in responsiveness in the individual results, of course, in increased keenness in discriminating things, which is well illustrated in the changes in the

individual's reactions which come at adolescence. Up to the age of fifteen or thereabouts girls are about all alike to most boys, but after this there begin to be groupings of various sorts, according to the reactions which have been found to be possible in respect of some individual whom the other members of a group repeat. These girls are sweet, those are ugly; these will allow liberties, those will resent them; these are socially inclined and gay, those are serious and sedate and given to their books, and so on.

On the other hand, broadened experience leads to broader grouping of a certain kind. The child who finds the kindliness and sympathy which characterize his mother's actions repeated in the other women of the community, will come to react toward all women as though they possessed these attributes. The woman-reaction having always been determined by these attributes will be so determined now and in the future. This is the genesis, although not the whole history (this will be sketched further along) of the general idea or notion or concept of psychology. Looked at in the making it is just the repetition of an adjustment to certain uniformly presented data, the exceptional things in the total complex gradually dropping out of account. Looked at in its possibilities, in its function in present and future adjustment, it is a definitely established mode of reacting upon an oft-repeated situation.

This business of grouping becomes an extremely complex one, of course, as may be appreciated when we consider that things are classified differently according as they are viewed from different standpoints, or as they are to be put to different uses. If the

child is dealing with the apple-world on the æsthetic side it will be classified in a certain way—this class will serve a certain æsthetic purpose, another class will serve another æsthetic purpose, while a third class may not serve any æsthetic purpose at all. Again, if the child is dealing with this same apple-world on the gustatory side his classifications will be very different from what they were previously. If his interest is a financial one he will group in still other ways. And then with these more special groupings there are the general groupings which include the particular classes. All men, the learner finds, are egoistic; but some strive for money, some for learning, some for social prestige, some for pity, and so it goes.

114. So, in summary, in all of the child's learning of individuals and classes he gets acquainted with individuals first, then conducts himself toward all other individuals resembling them as he does toward the originals. Then he continually makes smaller classes as he becomes more delicately responsive to the stimulations coming from objects; and at the same time he broadens his classifications because of certain fundamental characteristics which he finds repeated in an increasingly greater number of individuals. His response has reference at first to only the basal qualities in things—sourness, sweetness, bitterness, hotness, coldness, vividness of color, and so on—and this leads him to group things together on wide bases. But as his life grows more complex, and his evaluation of things becomes more precise in the effort to minister to his increasing needs, it is but to be expected that he will come to appreciate

possibilities in things that were of no concern to him in the earliest years, and this will lead to continual modification of his groupings.

It has been pointed out that the learning of individual things, so that their meaning for the organism can be gained from a single datum, in itself of little or no consequence, is the first requisite for adjustment to the world. And it must be evident that the power of adaptation to many individuals, or a group, through the wisdom gained from acquaintance with a single typical object is equally essential for adjustment to an environment of any degree of complexity. Nature says to the learner: "When you have got acquainted with so much of the world as lies about you, and have found out how to deal with it, then you must try to see in the regions beyond situations similar to those you already know. The great world is but a repetition in varied forms for the most part of the smaller world you have mastered, and you will prosper in the measure that you are able to discover likenesses between the two so that you may conduct yourself appropriately toward things new." So the child seeks to get everything strange he comes in contact with into one or another of his familiar classes of things; all his thinking, however complex and subtle, seeks to achieve this end. To illustrate, place a pupil in some new situation, say with a strange teacher, and see how he will conduct himself. The complex of presentations — classroom, classmates, teacher—suggests a familiar type of schoolroom conduct, but the particular signs afforded by the new teacher's personality have to be interpreted in order to discover just what sort of behavior will be

appropriate. Now see the child study the teacher, watching her face and movements and attending critically to the tones of her voice. And why? He is trying to discover what she is in terms of the teachers or other human beings he has had experience with so that he may act in the light of this experience.

§ 4. Developmental Changes Respecting the Characteristics Apprehended in Objects.

115. Our conception of the method of adjustment leads us to the view that an individual will apprehend those characteristics only of objects that affect him to some degree; and all qualities of a subtle character, the function of which in determining his well-being is not apparent, will escape his attention. But the attributes of things which engage one's attention at a special period may in the process of development disappear from the focus of consciousness, since the individual may acquire the power of adapting himself to the objects more or less automatically in respect of these particular attributes. We should expect that the point of view in regarding objects would be changed according as the individual is brought into new situations in the process of maturing which involve new relations to the objects. Take, for example, his reaction upon the apple at different epochs in his development. At first his concern with it will have reference to its gustatory properties only, possibly its size, too. But in time he may engage in the cultivation of apples, and then his welfare demands that he regard this object in a new light. His attention may be given now principally to the keep-

ing qualities of apples; or his commercial experience may enforce upon him thoughts of particular species of apples which alone find ready market where he trades.

Take another example of the change which development produces in the way one may regard things. When a six months' old child sees his mother or hears her voice near him he will struggle to get into her arms, showing that the thing foremost in his mind is what the mother *can do* to add to his pleasures. He is not at all concerned with her appearance as such, or the quality of her voice, or the quality of her character. But as he develops and observes the mother's conduct under varying circumstances characteristic modes of action become impressed ever more deeply. In every situation in which she is placed she tells the whole truth, and nothing but the truth, and this characteristic is so often repeated that it gradually becomes in a way differentiated[1] from the particular instances in which it has been observed, and the mother is conceived as *honest*. Whenever the mother is mentioned this characteristic may be prominently before the mind, because it has been so prominently there in all experience with her. This mode of regarding the mother will not appear, however, until the individual has got past the point where she can serve him continually by caring for his needs, carrying him here and there, etc., and until his contact with people has impressed upon him the value of honesty in human relationships. And the modes of conceiving the mother as frank, kindly, affectionate,

[1] I discuss the method by which this is accomplished more fully in Chap. XI.

patient, and the like, are developed according to the same principle.

116. If we follow the child's reaction upon any of the things around him we will see that such a change in conceiving them takes place in respect of all of them as has been indicated in the case of the mother. A child of two reacting upon his foot-ball shows clearly that the only thing focal in consciousness is the use to which the thing can be put. So with all of his playthings, and his clothing, and whatever else is capable of being put to any use. And his experiments with new objects have in view primarily to determine what he can do with them. He conceives of his dog, to illustrate, as an object that he can use; he can ride him, or frolic with him, or make him speak or perform other tricks.

The studies of Binet,[1] Barnes,[2] Shaw,[3] and others all indicate that the use to which things can be put[4] is the attribute which is the most prominent in the child's thinking. Binet reached the conclusion from the study of his two children, one two and one-half and the other four and one-half years old, that the *qualities* of things, in the sense in which this term is ordinarily used, appeals but slightly to children. His method of ascertaining the interests of the children

[1] Revue Philosophique, December, 1890.

[2] Studies in Education, December, 1896.

[3] Child-study Monthly, Vol. II., pp. 152–157.

[4] A distinction is sometimes made between *action* and *use*, but the distinction is rather logical than psychological. When a boy says "a horse runs" he has in mind really what can be done with the horse, rather than action *in abstracto* as it were. The child's concern with the action of things has reference to the way he can employ them.

was to ask them to define a number of common objects—animals, foods, table utensils, articles of dress, articles of furniture, natural objects, and the like—and the definitions practically always indicated what these things did, or what could be done with them. The fact that with this method the quality of use appeared far more prominent than any other shows that this attribute was the one most clearly in the child's mind, for the character of the questions would tend to suggest thoughts of quality and construction and classification rather than use. Barnes and Shaw pursued somewhat the same method and reached substantially the same results, although certain of their so-called "large terms," "quality," and the like are really not such at all. The young child who says that a "clock is a timepiece," or a "dog is an animal," or a "house is a building," is not indicating how he really conceives the object; he is simply giving a verbal series which he has learned in his school definitions. Again, to say that a "bottle is a recipient" is merely verbal, unless the pupil actually thought of it as holding liquid when the characteristic of use would be the most prominent. The only real test of the characteristics of an object which engage the child's attention is to observe him reacting upon it, and thus to determine what it is that attracts him. To ask him in the schoolroom to tell what a thing is, or even to place the name of it on the board and ask him to write about it, results often in calling forth what books have said about the things, and not what is paramount in the child's life. To illustrate: In Shaw's investigation one child said "water is clear and fleecy"; another,

"the snail is very dangerous"; another, "dogs are found in Newfoundland." Now these are obviously classroom definitions; the child would never think of such things outside of the schoolroom. So with many other statements that were gained: "A dog is white"; "a pencil is as round as the earth"; "there are two kinds of horses, one is the rocking-horse and the other is the real horse"; "a horse looks something like a cow"; "horses need wagons"; "the flower does not like it when it snows"; "we have mouths of our own"; "we have a hat";—all these statements which are collected under different heads by Barnes and Shaw cannot represent the true interest of children in the objects. The conditions under which they are gained militate against any truthful revelation of the characteristics which are really focal in the child's mind in reaction upon the objects.

117. Interest in animals in the early years is unquestionably in what they do that the child can take advantage of in some manner. There is no appreciation of, or interest in, structure as such; or at any rate it is obscure, indefinite, ill-defined. A child of three or four will tell you that the squirrel jumps on its legs, and crawls with its toes, and hears our voices with its ears, and eats nuts with its teeth, but he has given no attention to the mechanism of any of these organs, and he is not vitally concerned with them. And so it is with all the active life which he observes about him, and even with the people he observes. A child may be interested in the uses of the parts of a building, but he is not eager to know how these parts are put together, and how the whole is made possible by certain modes of construction.

Questions of structure in any object get attention relatively late in the individual's development—only when the needs of adjustment demand an examination of the minutiæ of the processes which go on about him. This need of more perfect adaptation gives rise to the analytic tendency, which aims to uncover hidden processes that their operations may be more clearly discerned. But the point is that the analytic activity appears relatively late in the child as it has appeared late in the race. Primitive peoples regard the world in the large; they deal with situations as wholes for the most part. They cannot analyze phenomena so as to discern the fundamental factors which occasion them. But in later times analysis has become the most prominent activity. Science is analytic. It breaks up complex wholes to discover their elements and how each works in cooperation with the others. All evidence indicates that the individual's development is a kind of recapitulation of this racial course.

118. There are many who believe that the child very early manifests this analytic tendency. As evidence it is said that young children will take a watch or other mechanism apart to discover how it is constructed. Children of tender age, too, pull flowers to pieces, and even dissect in a crude way birds, kittens, and other forms of life. It is of course true that a very young child will pull a complex thing to pieces. But now the year-old child is not analyzing the flower or the watch when he reduces it to its elements. He is taking no account of how one part is related to the other parts and to the whole. Perhaps this should be regarded as the

initial form of the analytic activity; it gives a realization that complex things are composed of parts. But it is not true analysis; this comes only after the individual has had much experience with things as wholes in any field. Lukens,[1] Barnes,[2] Sully,[3] Clark,[4] and others tell us that the individual gives little attention to the details of things he draws until toward the beginning of adolescence. Up to that period he uses his drawings largely in a symbolic way; he is little concerned with technique. Again in the study of language it is generally believed that analytic work in formal grammar ought not to be entered upon before the high-school period. Hodge,[5] Jackman, and many others observing children's interest in nature agree that dissection should not be begun until the high-school period is reached, and some think that even here the pupil has no real interest in anatomy as such.

[1] Ped. Sem., Vol. IV., pp. 79–110.
[2] *Ibid.*, Vol. II., pp. 455–463.
[3] In his Studies of Childhood, Chap. X.
[4] Studies in Education (Barnes), p. 283.
[5] See his Nature Study and Life.

CHAPTER X.

THE NATURAL HISTORY OF CERTAIN TYPICAL "SENSES."

§ 1. A Preliminary View.

119. It is a familiar enough fact, however it may be stated by different persons, that all organisms are constructed on a plan whereby a stimulus received through one avenue will lead to effort to secure or avoid stimulations through other avenues which formerly were gained in connection with the stimulus now acting. This serves to make the individual dynamic, aggressive; not quiescent or indifferent. It is needless to argue the proposition that an organism constructed on a plan whereby it would be satisfied with the mere reinstatement, or echo, of experience could not survive. The condition of survival, speaking generally, is the *repetition* of experience, and this must be secured through some element of an experience reminding the organism of the total effect gained from this source on previous occasions. Or, speaking more precisely, a simple stimulus must set up in the organs originally involved in the complex experience of which this stimulus is an element, an excitement which acts as an incentive to the organism to have the original

experience repeated. Current theory gives us the view that an organ active in a certain way "craves" a repetition of the action under circumstances similar to those accompanying the initial experience. And this seems to be the case in respect not only of one's post-natal experience, but it is true as well of his inheritances. Groos has lately made clear a point which has been expressed in one form or another many times—that the child almost at birth seeks sensory stimulations for the pleasure exercise of any sense gives. In ontogenesis organs crave a repetition of stimulations that have been often experienced in phylogenesis, and the organism becomes aggressive in striving to get these stimulations through experiment with the environment.

§ 2. The Sense of Location.

120. This principle is mentioned here, since in its fundamental features at any rate it is at the bottom of one of the most interesting and important phenomena of adjustment—the "questioning activity" in the young, or the old, for that matter. One of the earliest forms of the child's questions is concerned with the whereabouts of objects in which he is interested, but which he cannot see nor lay his hands upon. The child of two years asks his mother "Where is my hat?" and this is typical of questions he is putting constantly. The occasion for this question may be his desire to go out, or he may see his brother with his hat on, or the hat may be mentioned in the course of conversation, or he may observe going-out preparations taking place

on the part of persons in the room; or in some way the idea of the hat appears in consciousness, and then the child proceeds either to get the thing or to run to his mother or some one else and ask where it is. If he can put his hand on it he does not ask the question; it is only when his searching does not reveal it that he comes to some one whom he has discovered is competent and disposed to help him out.

Now we must go back a little to trace the steps by which this question is made possible. To begin with, the sense of searching for a lost object appears as early as the seventh month probably; for children of this age when food or a plaything gets out of sight will look about as if hunting for it. The child of two months will not search for things. If his ball or cookie gets out of the range of vision or touch it exercises no further influence upon him; it is annihilated so far as he is concerned. He has no sense of its being somewhere. It is true he may cry, but this is not for the conscious purpose of obtaining it again; it is an expression of regret, or perhaps anger, that his pleasure has been so suddenly terminated. Of course his demonstration will be serviceable to him, and this may be why crying in childhood has survived; but the child is at first ignorant of the whole matter. "Out of sight, out of mind," is true of all experiences of the infant, if sight is understood to include the other senses.

But in the course of time one may see him conducting himself very differently when an object he desires gets away from him. He does not content himself with sucking his fist or crying, but he makes

an effort to secure the object again, either by striving to bring himself into correspondence with it, or by imploring assistance from others. This phenomenon must be due to the fact that the memory of the object persists in consciousness, if not focally then at least marginally, and the organism seeks to have sensations derived from actual contact with it repeated, believing that it is still existent somewhere. Now the development of this belief has come about through the child's experiences, repeated hundreds of times every day after the fifth or sixth month, wherein an object having escaped from sight, the next moment it appeared in view again; or when it was lost to vision it would be found directly by tactile exploration.

At first, of course, the idea of lost and found, of the continuity or the permanency of things, does not occur to the child. But as his experiences increase the consciousness is gradually developed that when a thing disappears it is not gone forever. When then at the seventh or eighth month a pleasure-giving object gets out of sight the organism seeks to establish connections with it again. This results in motor activity; the child moves about, and accidentally the ball is brought within his range either of vision or of touch. And the point is that when this process has been gone through with a vast number of times there begins to be established a sense that by moving around the desired object can be obtained, and this is the typical form of the searching sense in its incipiency. At first the searching is wholly illogical; the child simply looks about here, there, and everywhere. He does not consider circumstances and look in some

definite place or direction for the thing he wants. But with the multiplication of experiences he comes in time to get things associated together, so that his searching becomes more rational. He slowly discerns, for instance, that when the ball rolls out of his right hand he should look on the right side for it Of course he must have a great many hit-and-miss experiences before the hits begin to appear more frequently than the errors, but in due season a particular feeling of how to turn the head and body and where to extend the hand gets coupled with the particular motor and equilibrium data given by the ball being released in a certain position, and with a certain direction and a certain force; and thus the logic of search gets started. Other factors than those indicated, it is hardly necessary to add, co-operate in developing this complex sense of just where things go when they get out of reach. The extension of the range of vision and the development of motor control, so that the senses can be brought into contact with wider reaches of the environment, are important factors in enabling the child to keep things in view when they get away from his hand, and so to give him the feeling not only that they are somewhere, but that they are in a special place.

But the problem of chief interest here is how the child gets to believe in the continued existence of objects after they have become separated from him, and why he seeks to get them, and not how he comes to know precisely where they exist. And the answer is that the sense of continued existence is developed through the initial experiences of the child, wherein he slowly learns that out of sight is not out of the world, because he can receive all the impressions from objects

once escaped from him, but later restored to him, that he received originally. At the start the consciousness of permanency is doubtless confined to particular occasions and things when they have got out of reach, but with experience this consciousness becomes more and more generalized into a sense of the permanency of most of the things in the universe.

It seems highly probable that the native constitution of the mind assists in the development of this sense. It is inconceivable that the child could develop this activity *ab initio*, as he probably does certain of his activities in reading, for instance. The individual must receive from the race the basis for the development of this sense, but the racial contribution is not definite; it needs experience of a certain kind to make it effective. It is true that the child at birth manifests this sense in a way, for he will cry to be fed or cared for, showing an instinctive confidence in the existence of food and of care-takers somewhere. But aside from a few such instances there is no indication that he has at birth even instinctive faith in the permanency of those phases of the world with which he is not in direct physical contact.

121. This desire to have a complex situation represented as it has been experienced on former occasions, when some element thereof is revived, which is fundamental in all adjustment, is illustrated strikingly in children's early endeavors to adjust themselves to pictures. When one shows a child of a year and a half or thereabouts a picture in which appears but a part of a familiar object, as of a man's body, for example, he will be quite apt to ask where the other part is, and will be much distressed until the entire man is percepti-

ble, or until in some way one makes him feel that the whole man is there, but a part is hidden from view. Instinctively a parent helps his child in such a situation by trying to make the missing part of the object real and vivid, so as to satisfy the child's desire for completeness, instead of attempting to explain that the picture is but a shadow of reality, since then the situation could not be made complete, as it always is in the child's concrete experience. A child of this age will look behind pictures and mirrors to discover the parts of things that do not appear on the surface, so to speak. For instance, if he glances at a picture showing a horse's head facing him he will not fail to look behind the picture for the rest of the animal; and this is but typical of many examples of this sort reported by Preyer, Sully, and other observers.

But as the child develops he learns by repeated experiment that when a horse's head is seen under these conditions, and presenting certain peculiar appearances, nothing but the head can be discovered, and so he corrects his original tendency to look for body, legs, and tail when he sees a head. It is, of course, a simple enough fact, but of much significance in this connection, that if an artist represents a thing very faithfully, as we say, the child of some maturity even cannot distinguish it from the original, and he will go on trying to complete in flesh-and-blood actuality the situation which is but suggested, and he will react to it as though it were real. The learning how to react to a picture is not essentially different in the final analysis from the learning of the real thing originally. But the point is that the reality being learned first, it is difficult for the child to get along with a partial representation of

it later. It is a struggle for him to modify his former way of conceiving and reacting to things that presented the data, some of which are gained from the picture, denoting a peculiar condition of the object.

122. To return to the child's gaining a sense of the whereabouts of things, there is a form of this activity which is much like that already discussed, but it may receive a word in passing. A child watching the sun go down behind the lake asks "Where has it gone?" Previous to this, when his football got out of sight but a short way he inquired where it had gone, and soon he discovered its whereabouts. And so with his marbles, with his parents when they escaped from him, and so on. In all his daily experiences he has had evidence that when objects disappear they still exist some place. In his nursery life, when his playthings went rolling off he followed them innumerable times, and now when anything disappears he is impelled to follow it, at least ideally, that he may image where it is. The thing going drags him mentally after it, and if he cannot complete the picture for himself, then he prays for help by his question.

It is of course important that this tendency should have been conserved in the race and inherited by the child, for his well-being will depend in no small measure upon his disposition to ascertain the whereabouts of everything he has seen or heard or used in some way and that has gone out of his range of sense contact. And here as in all his other activities it is his aim at first to bring himself into immediate contact again with things that have disappeared. But as development proceeds the desire for repetition of sense experiences with familiar things grows less and less, so that the

individual is satisfied if he has the ideal elements of his experiences reinstated. Again, we should expect that as the child got some satisfactory view of where the sun went when it passed out of sight he would cease to ask the question, and the sunset would occasion him no particular anxiety, so far as the destination of the orb of day was concerned. The situation which was at first completed with difficulty is now completed in a more or less subconscious and automatic way, and the thing which all observers have noticed happens —the child's curiosity about the going down of the sun gradually disappears. And to say that curiosity with reference to a certain thing disappears means that there is no longer difficulty in completing all the situations in which this thing enters,—situations respecting its origin, its destiny, its whereabouts, its composition, its attributes, etc. Curiosity is just this effort of the organism to get situations completed. The child could not be curious about the destination of the sun at sunset if he had not got the sense of its going somewhere from his experience with the things around him, by which he learned to always look for the whereabouts of things that had disappeared.

There is doubtless born with the child a general tendency to look into everything, to explore the unknown, but it is questionable if this would amount to much if the experiences of the nursery had not shown him that it pays to keep on the *qui vive*. A child of six is not curious with respect to a complex situation if he has had no experience with it, or with something akin to it. Catch him at any point in his progress toward maturity, and it will be found that he is curious about a thing only when he has already had experience with

something like it, but he cannot now complete his adjustment to it without an effort. It is sometimes said that people are always curious about the unknown, but as usually interpreted this proposition is not true. Much of what the physicist or chemist or engineer is most curious about I am utterly indifferent to. These things incite in me no disposition to complete certain situations, for the reason that in my experiences I have not often been placed in situations wherein these things were elements. Esquimaux are not curious about the architecture of St. Peter's at Rome, nor is a plough-boy curious about the way Beethoven wrote his symphonies; and the principle is clear in both cases.

123. The feeling after the whereness of things to complete present experience is still further indicated in the question, "Where have you been?" much like the others given above. The child of two or so will say to his mother, "Where has mamma been?" He will ask of his dog as he runs into the room, "Where have you come from?" When a plaything is brought him he will inquire where it was got. Children often ask when they see the sun, moon, stars, or clouds, where they come from; "Where did the baby come from?" and so on. Now these are not questions of *origin* in the sense in which some observers use the term; they do not relate to the beginnings, the genesis of things. They relate to the place from which the things proceed, to where they were before the present moment. The state of consciousness established by the present stimulus is one of a vague, indefinite sense of a someplace, and there is an effort to make this vague state clear and precise.

Of course this question is developed in the same way that those of which we have already spoken are developed. The infant has continually impressed upon him the idea that people and things come from places. He is hiding in some corner and rushes up to his mother, who exclaims: "Where did baby come from?" or "Where has baby been?" and this impresses upon him the notion of his having been somewhere. Innumerable experiences of this sort develop the sense of a someplace from whence come absent things, and which peace of mind requires to be made as definite as possible. The need of this is perhaps not as great as to know where things are going, and as a matter of fact the question "Where have you been?" is heard in the child's life less frequently than the question "Where are you going?" and "Where has it gone?" The interest in this form of question never wholly disappears, though it becomes less and less pronounced as experience gets things and their customary wanderings definitely connected together. A child of five will not ask her father when he comes home at noon from the university or his office where he has been. This is one of the situations that is so easily filled out ideally that there is no occasion for the question. On the other hand, simple rural folk will always ask a friend or even a stranger whom they chance to meet where he has been. Their curiosity is never quenched. The urbanite, though, will not be quite so curious, even if he does not know where his neighbors have been or have gone, and one reason for this is that his mind is filled with other interests, and there is no chance for many of the stimuli which play upon him to become completed by reinstating their associates.

The countryman's consciousness is always in proper condition for such a stimulus as the sight of a neighbor travelling to produce restlessness until there is completed ideally the complex situation of which the traveller in his present position is a factor.

§ 3. The Sense of Cause and Effect.

124. We have now to glance at the origin and development of another variety of adjusting process which more than any other has attracted the attention of philosophers, psychologists, and students of childhood. It is mentioned by all observers that by the time children have reached the age of three or thereabouts they are continually asking questions regarding the causes of the phenomena that occur about them—"What makes the sun shine?" "What makes it rain?" "What makes the moon get smaller?" "Who made the sky, thunder, grass,—everything?" and "How did he make them, and why?" These are typical of questions the child is putting continually. In these questions he shows he is feeling after some agency which lies back of the phenomena he observes. And as we watch him in his development we see how this feeling is awakened. At the very beginning there is no evidence that he has the slightest conception of a relation of cause and effect; his is a life of happenings without antecedents in any conscious sense, though in certain of his instinctive activities something like this relationship seems to be implied. In his crying, for example, he expects (if one may so speak) that the cry will move the mother to come and minister to his needs, but there

is not much of even this sort of thing in the life of a two-months'-old child. But by the fifth or sixth month, probably, he is being constantly impressed with an agency back of all that occurs. He sees that he is incessantly producing effects himself; and in his small world he is discovering that nothing ever happens except on account of the agency of some person or other living thing. At first cause and effect are in consciousness at practically the same instant. The spacial and temporal interval between the cause acting and the effect produced are very slight, and the two get connected together in the child's thought. As his sphere of activity widens the cause and the effect are not always in such immediate juxtaposition, but yet they remain close enough to be associated together because of having been experienced close together. In the beginning the child usually saw the mother shake the rattle, and do all sorts of things. But by the close of the first year he must turn around perhaps to see who rolled the ball to him—this as a type of familiar occurrence upon which the sense of agency seems to be founded. Then later he must crawl to the door to see who has performed some act; and gradually as experiences of this sort multiply the sense of something acting behind all occurrences gets established, and the child seeks to complete any situation when an event occurs by searching after the thing that occasioned it. At first he wants to actually *see* the cause, since it must be a person or dog or cat, but in time he will be satisfied if he can get simply the ideal situation reinstated—if he can see in his mind's eye what was the occasion of any happening.

It may be remarked in passing that the development of this sense of agency is greatly aided by the tendency of the child's elders to impress upon him by their questions the idea of every occurrence having been caused by some one or something. "Who did this?" the mother asks many times a day, or "Did you do it?" And this results in leading the child to think of agency at first as always human; *who* caused it is the question. "Who broke the moon?" children of two ask when, having seen the full round face of the lunar body one night, they see it some time later in its decline. It is a familiar enough fact, of course, that the very young always put human forces behind natural phenomena, though they come earlier than many believe, I think, to the conception of a some *what* as the source of events. Between his second and third birthdays, looking at the clouds floating across the sky, S. asks: "*What* makes them go?" and this is typical of questions he is asking constantly.

And I can explain the phenomenon to him without bringing in human agency, for by this time he has connected the waving of the trees, the motion of the leaves and paper and his own dress, etc., with the blowing of the wind, and this may now be used as a cause of events. Of course the wind itself is doubtless at first nothing but a kind of man, and the child shows this in his fear that the wind may catch him. But it gets speedily to be a very peculiar man, that does only peculiar things, and that cannot be seen but only heard as it whistles through the limbs and cracks in the house. Then with increased experience the chasm between human and wind agency is made

ever broader, and they are ultimately wholly dissociated.

125. Of a kind with the seeking for a cause is the seeking for a motive or end or teleology of phenomena; or in popular phraseology, searching for a reason for happenings. The child of three or less will begin asking, "Why does God make it rain?" "Why does it thunder?" "Why do flowers come out in spring?" and so on *ad libitum*. This question, introduced by *why*, may denote two different attitudes of mind. In one case the individual may really be seeking for the cause of the thing engaging his attention, as when he asks, "Why is it so cold?" and "Why does winter come?" when he is seeking the agencies which produce winter. But when he asks such questions as "Why does the wind blow so hard?" "Why does lightning go in streaks?" "Why do cats catch mice?" etc., etc., he is praying for light as to the end for which the action in question is performed. He is striving to have completed a situation one element of which is an agent acting, but the end to be attained is not apparent. He is impelled to seek this end, since all of his experience has enforced upon him the idea that there is always an end to be attained, and he reaches the point where he cannot regard a phenomenon apart either from its cause or from its teleology, and in either case the organism will not be satisfied until the general, indefinite situation has become more definite and assured. When this is reached the questioning attitude ceases, of course.

§ 4. The Sense of Means.

126. One in immediate contact with young children cannot fail to see that one of the most prominent forms of the questioning activity has to do with discovering the method, the *how* of doing things. "How do trees grow?" "How did God get up into the sky?" "How does rain come through the clouds?" are typical questions a three-year-old is asking constantly. If the foregoing account of the development of questioning activities is a correct one then it will be easy enough to explain the child's questioning after the *how* of events. The notion of the method of doing things is constantly impressed upon him from the outset. In his nursery the problem of how to perform actions, how to achieve ends, is an ever-present one, and he is incessantly seeking aid from those about him. He is shown how to overcome some of his difficulties, while others cannot be mastered. For instance, he cannot be helped to fly, he cannot get the moon which he desires, and so on. In all these experiences the attention is turned prominently upon the way of accomplishing a deed; and this idea is further impressed by the mother who keeps asking the child how he did this or that or the other thing.

So it comes about, in the way which has already been indicated, that when the child sees a certain achievement there is set up a desire to know how it was achieved. Like the other questions this does not appear until he has had much experience himself in attempting to do things, and the *idea of a way* has forced itself upon his attention in certain situations.

The child of a year, it is safe to say, never manifests any concern about how a squirrel got up a tree; it is doubtful if he is at all conscious of the *method* of doing this thing when he sees a squirrel in the branches above him. His attention is centred in the object as such, and there is no effort to complete a situation by seeing how he got where he is. The how of doing this sort of thing has not been prominent enough in the experience of the yearling to come forward on this occasion. A little later when the child is struggling constantly to do things of this character the how of it will come up forcefully to him, and become an element ever afterward in his reacting upon this situation. Of course, when the method is easily discerned there will be no tension, and so no question.

127. It is hardly necessary perhaps to add that the eagerness to discover causes and effects and modes of action lasts as long as life does, and it is possible that it increases in intensity with the passage of years. It is not so demonstrative, however, in maturity, at least in the child's way, though all the research and much of the discussion of adult life have in view the discovery of the rationale of things. The intelligent man's mind is in a constant state of tension with respect to most phases of the universe; he is never at rest; he is incessantly asking, From whence? Whither? Why? How? These are just the questions the child is asking, too, but they relate to the simple happenings, as the adult thinks, in his immediate environment, and he applies to his elders to help him out. The man, though, is concerned with matters more intricate and subtle, and he must work them out mainly in his own mind, which leads some to think that he is not very

eager and active in searching for causes and effects. But it is probable that no mind can behold phenomena without attempting to construct ideally, though not always in a conscious way, the series of events out of which they spring. It is not optional to seek for causes; it is mandatory.

CHAPTER XI.

THE RETENTION AND ABRIDGMENT OF EXPERIENCE.

§ 1. Methods of Keeping a Record of Experience.

128. In what has been said thus far regarding the processes of learning it has been implied, of course, that there must be some method of keeping a record of past events and using it as a guide for the future. The first condition of learning is the retention and reproduction of experiences (including impressions and the outcome of reactions upon them), so that they can be used in present situations. Sidis and others have cited instances of persons who on account of some accident forgot all they had ever learned, and they became as helpless as infants before the world they once were able to adapt themselves to. One cannot conceive of a stream of water ever learning anything, since all impressions made by objects, as the wind which lashes it or the boat which glides upon it, are erased as soon as they are made, and every new impression is received as a total stranger.

129. There are, as we should expect, different methods of keeping the records of experience, necessitated by the needs of efficiency and economy in adjustment to a complex environment. There is, in the first place, the method of associating together impressions—visual, gustatory, auditory, and others—

derived from any single object, as an apple or a tree, and organizing these with motor activities required for proper reaction upon them.[1] This is the method of *simultaneous association*, using the term in the sense in which it is employed by Wundt,[2] Titchener,[3] *et al.*[4] These several impressions are usually

[1] Baldwin (Mental Development, Methods and Processes, p. 310) emphasizes the importance of motor reaction in binding together sensory elements in experience. Different impressions are made to hold fast to one another in memory because they are "used together" in action.

[2] See Human and Animal Psychology, p. 283. See also his Physiological Psychology, II., chap. 16.

[3] See his An Outline of Psychology, p. 191. Pillsbury holds that *simultaneous* association may take three forms, but these are simply aspects of the general process denoted above. "We may have associations between sensations that enter consciousness together within the same modality, 'associative synthesis'; we may have associations of a newly entering sensation with ideas already present, 'assimilation'; and we may have associations between ideas from different modalities, 'complications.' In associative synthesis the elements are closely knit together about some prominent member of the group, and their individuality is frequently lost in the whole. A musical clang affords the best instance of this kind of association. In the complication the different elements may be completely distinct and individual. Here, too, the elements come from different modalities. Examples of such a union are the connection between the idea of a word and the movements of the larynx that accompany its utterance in speech, and the connection of visual and tactual elements in the formation of the idea of a thing."—*A Study in Apperception*, American Journal of Psychology, Vol. VIII., p. 332.

[4] For a general review of the subject of Association see the following: Robertson (George Croom), Philosophical Remains, pp. 107 *et seq.;* Spencer, Principles of Psych., chaps. 7 and 8; Ward, Encyclo. Brit., Vol. XX., p. 60; James, Prin. of Psych , Vol. I., chap. 14.

experienced simultaneously; the object is seen and tasted and touched and named and grasped, or thrust away, at practically the same instant. The first act of adjustment occurs in view of all these data, and so they get organized into a unity, although the elements thereof retain a certain degree of freedom to form attachments with other units in a way to be described hereafter. Now, when a single datum of this complex is presented to consciousness the total situation tends to become *redintegrated* in Hamiltonian phraseology. "What the organism finds together in the world in which it lives," says Titchener,[1] "remains together in perception or idea, although elementary mental processes may on occasion become disjoined from their original complex wholes and enter into combination with other elementary processes."

Usually this process of redintegration occurs so quickly and noiselessly that we are likely to think we gained complex wholes as such originally, and not as elementary factors which have become integrated into these wholes. But we can sometimes see the process at work in the way persons react to spoken or written language. When the listener hears the first word of a sentence he will often run ahead to the others before they are mentioned if they have been associated in this way many times. An audience not infrequently moves faster in constructing sentences than the speaker who utters them. Bagley found this to be the case in some of his experiments. "Occasionally," he says,[2] "the observer's

[1] *Op. cit.*, p. 208.

[2] *Apperception of the Spoken Sentence*, American Journal of Psychology, Vol. XII., No. 1, and Reprint.

apperceptive process anticipates the succession of symbols constituting the objective stimuli and forming the spoken sentence. This phenomenon is probably unnoticed because the premature apperception tallies with the complete interpretation." I have tested a child of five who had just begun reading, by asking her to close her eyes while I traced on her hand the first letter of words with which she was familiar, and she was to tell me what the *letter* was. As I traced H, she said "hot," the complex with which H has always been associated. So she would supplement B with *ox*, with which it had always been connected. (It should be said that the child began reading with words, but yet knew H and B when seen as separate elements, and she could give their names.) There may be some question about the wisdom of calling these last instances cases of simultaneous association, but it seems that they show the thing in the process of making, at any rate. When the child is learning a word (visual, auditory, vocal, or graphic) for an object he progresses from a point where the items to be associated are in consciousness at successive periods, and are apprehended separately, to the point where they seem to be fused into a whole and are in consciousness simultaneously. Experience is all the time making associations that are often repeated in our lives simultaneous, though they are at first successive.

130. But not all the events of our lives can be made simultaneous, of course, though unquestionably this is done whenever possible. However, some events succeed one another in, relatively speaking, considerable intervals of time, and a record of them to be

of much service in adjustment would have to represent them in this way. Then suppose a child has had a series of experiences for a number of days—*a, b, c, d, e, f, g;* he has arisen in the morning, *a;* taken his bath, *b;* eaten his breakfast, *c;* has had a game with a playmate, *d;* has gone to school, *e;* has recited first in his reading, *f;* has then recited in his number, *g;* and so on. Now, to-morrow when he starts out on the day's enterprises the series of events experienced on previous days will probably be reinstated more or less explicitly, the several items appearing in the sequence in which they originally occurred. If their order be repeated a sufficient number of times it is certain that there will be instituted a sort of anticipatory adjustment. This is the method of contiguity, the *successive association* of Wundt and Titchener. Experiences that have been repeated in a certain sequence become coupled together, and the learner is able to foretell what will happen in the future, and he is thus afforded an opportunity to govern his conduct to-day in the light of what took place in the days past.

For the most part events in daily life occur as they have occurred, not always in precisely the same way, of course, but from day to day there will be no great variation in the lives of most individuals. When there is a marked departure from the customary order it is plain to see that the individual becomes confused. He gets out of line with things; he cannot anticipate the happening of events, and so he cannot pre-adjust himself, which alone gives ease and assurance. Such a person is in some such relation to the world as the new-born infant. This phenomenon is often

witnessed when a child enters school, or even college, and begins a wholly new régime of life. He is at first bewildered, and behaves much in principle as the infant does. He is quite ill-adjusted, that is to say, to the particular environment in which he finds himself. Only little by little does he come to learn the new order of things. But when he at last gets running on the school-room schedule he goes on his way without further embarrassment, taking the happenings of school life as a matter of course; which means that they are not new to him when they occur—he is never taken unawares, for he is always foreminded, or perhaps foreadjusted.

131. Aristotle declared long ago that ideas were reproduced in three different relations—contiguity, similarity, and contrast; and psychologists since his time have quite generally adopted his view, although we are not in our day hearing so much about similarity and contrast as constituting bonds of association between ideas.[1] Similarity is said to be a form of contiguity for the most part, and contrast is at bottom similarity, constrasted objects usually differing in only one minor characteristic; as when a large man suggests a small one the real bond of connection is the *man*, the complex of common elements. It is highly improbable that extremes in things suggest one another often. When we see a large man we go on thinking of what he can do, how much he weighs, what size

[1] Titchener, for instance, does not mention similarity or contrast as modes of association of ideas, and Ziehen argues that in the last analysis they are but forms of contiguity. Ward (Encyclopædia Britannica, ninth edition, Vol. XX., p. 77) makes similarity a phase of contiguity.

clothes he wears, and so on. What use would it be to think of a black man when one sees a white one? How could that assist in adaptation? How effectually one would be alienated from his environment by such thinking. To act as though one were dealing with a negro when he is in the presence of a Caucasian, or as if it were the fourth of July when the thermometer is $-25°$, would be to conduct one's self after the manner of the insane.

132. But some may say, as many have said in the past, that it helps one to comprehend a thing for him to contrast it with its opposite. He can better understand a cold day if he thinks of it in connection with a hot one; this brings out the difference and gives us a standard by which to measure the cold day. This sits well on the ear; but how can one have a warm-day consciousness and a cold-day consciousness at the same time? When one thinks of the Fourth of July there is revived a great complex of experiences centring around this date; consciousness is filled with things with which it has been concerned at this season in the past, and there is no room for the zero consciousness, with its elements of snow and frost and ice and cold hands, and all the other accompaniments. The Fourth-of-July mood cannot exist on intimate terms with the middle-of-January mood; the two will not harmonize, and the one seems to have little power to make the other more effective, except possibly that the violent change of going from one mood to the other intensifies the feelings centring about either one. The logician may readily think by contrasts in his study, and the layman may reflect upon his surroundings and see that things are contrasted, but neither proceeds in

this way when he is actually dealing with objects in his efforts to get adjusted to them.

So far as one can tell from the activities of the child he does not recall past experiences as contrasted with present impressions; he does not think of the day when night comes on, to mention the classic example of certain psychologists. Rather, the night brings its own distinctive circle of thoughts and reactions thereupon; and if the day comes before consciousness at all it is simply because the anticipatory action of the mind, running along old series of events, finally reaches the day, which will bring safety from harm or opportunity for games and plays. Often one hears the child say when it is tucked in bed, "To-morrow I can have a good swing, or I can go to see Elizabeth," or what not; but did any one ever hear a child say when taken into the dark, "Oh! how bright the day is compared with this night"; or when he tasted a lump of sugar, "Oh! lemons are so sour"? What a state of affairs we should have if a lump of sugar tended to reinstate a vinegar tone of consciousness!

133. But how about the method of similarity in keeping a record of past events and reviewing it? The method of remembering by similarity means that in two series of experiences, *a-d-g-j-k* and *b-e-f'-j-m*, quite different from one another in their outcome, there is a factor, *f'*, which has many elements in common when regarded from certain standpoints. As it is found in these series; as it is acted on by *g* in one case and *e* in the other, and as it acts on *k* in one case and *j* in the other, it is not just the same thing, but the bonds of connection in the present series are not as strong as old associations, and when *j* is experi-

enced, *f'* is revived and consciousness runs out on *j-m*. Suppose you tell a child the story of the three bears; then when she goes in to luncheon and sees the three bowls of bread and milk, she at once runs out on to the story series and conducts herself as she fancies Silver-hair did. She does not eat her bread and milk as she has done before; these are bowls of soup now, and so on through a long list of events.

The writer was witness to a scene recently which illustrates in a striking way the principle here involved. A story had been related, in the hearing of a seven-year-old child, of the terrible deed of a St. Bernard dog that had formerly been very kind, but that had grown old and savage, and had finally attacked his master and killed him. A near-by neighbor had a St. Bernard dog with which the child had romped and played for several years; but the day following the narration of the story she met the dog and ran to her father in fright, imploring his protection. It was some time before her confidence was restored, and it seemed as if increased experience with the kindly dog, though always most agreeable, was never quite able to overcome the reaction gained from the story. We know how in oral discourse a certain sound or a word will turn one off from one train of thought on to another wholly distinct from it; the factors *f* and *f'* are alike in sound, and consciousness runs out on the *f'* series. The associates of *f'* are for some reason more active at the moment than the associates of *f*. As Dewey says[1] in discussing reproduction by similarity, "If any activity has frequently recurred, any element often recurring gains in redintegrating power at the

[1] Psychology (Harper & Brothers, 1893), p. 103.

expense of those occurring less often, and will finally gain power of acting independently so as itself to red-integrate ideas by the law of continuity." James[1] discusses the matter in a most satisfactory way, and his words may be quoted at some length:

"*Spontaneous Trains of Thought.*—Take, to fix our ideas, the two verses from 'Locksley Hall':

"'I, the heir of all *the ages* in the foremost files of time,'

and

"'For I doubt not through *the ages* one increasing purpose runs.'

"Why is it that when we recite from memory one of these lines, and get as far as *the ages*, that portion of the *other* line which follows, and, so to speak, sprouts out of *the ages* does not also sprout out of our memory and confuse the sense of our words? Simply because the word that follows *the ages* has its brain process awakened not simply by the brain-process of *the ages* alone, but by it *plus* the brain-process of all the words preceding *the ages*. The word *ages* at its moment of strongest acivity would, *per se*, indifferently discharge into either 'in' or 'one.' So would the previous words (whose tension is momentarily much less strong than that of *ages*) each of them indifferently discharge into either of a large number of other words with which they have been at different times combined. But when the processes of '*I, the heir of all the ages*,' simultaneously vibrate in the brain, the last one of them in a maximal, the others in a fading, phase of excitement, then the strongest line of discharge will be that which they all alike tend to take. '*In*' and not '*one*' or any other

[1] Psychology, Briefer Course, pp. 256–259.

word will be the next to awaken, for its brain process has previously vibrated in unison not only with that of *ages*, but with that of all those other words whose activity is dying away. It is a good case of the effectiveness over thought of what we called a 'fringe.'

"But if some of these preceding words—'heir,' for example, had an intensely strong association with some brain-tracts entirely disjoined in experience from the poem of 'Locksley Hall'—if the reciter, for instance, were tremulously awaiting the opening of a will which might make him a millionaire—it is probable that the path of discharge through the words of the poem would be suddenly interrupted at the word 'heir.' *His emotional interest in that word* would be such that its *own special association would prevail* over the combined ones of the other words. He would, as we say, be abruptly reminded of his personal situation, and the poem would lapse altogether from his thoughts.

"The writer of these pages has every year to learn the names of a large number of students who sit in alphabetical order in a lecture-room. He finally learns to call them by name, as they sit in their accustomed places. On meeting one in the street, however, early in the year, the face hardly ever recalls the name, but it may recall the place of its owner in the lecture-room, his neighbors' faces, and consequently his general alphabetical position; and then, usually as the common associate of all these combined data, the student's name surges up in his mind.

"A father wishes to show to some guests the progress of his rather dull child in kindergarten instruction. Holding the knife upright on the table he says, 'What do you call that, my boy?' 'I calls it a *knife*, I does,'

is the sturdy reply, from which the child cannot be induced to swerve by any alteration in the form of question, until the father, recollecting that in the kindergarten a pencil was used, not a knife, draws a long one from his pocket, holds it in the same way, and then gets the wished-for answer, 'I calls it *vertical*.' All the concomitants of the kindergarten experience had to recombine their effect before the word 'vertical' could be reawakened."

134. It seems evident enough that in any complex consciousness there will be more or less switching off from series of experiences on to others, due to the similarity in respect of auditory or visual characteristics of factors in each of the series. The sequential order in many series will not be so firmly established but that thought can be steered off onto another track by the switchman who stands at the parting of the ways. But this is certainly not always an advantage in adjustment; on the contrary, it is sometimes a real detriment, as when a listener hearing read the line,

"I, the heir of all the ages," etc.,

goes from the word *heir* on to an atmosphere series, and so loses connection with the situation in hand. Every case of shunting off in language in this way must prove a disadvantage, except possibly where the right and the wrong sequences are both before the mind, and the absurdity of the wrong sequence, in this particular setting, is appreciated, and the situation excites mirthful reaction. A distinguished American responding recently to a toast at a dinner abroad was praising his country for its greatness in all things, even in art, in which she was thought by some to be very crude. He said he knew an artist who made a

picture of a hen so faithful to the original that one day "she fell from her hangings into a barrel and *laid* there." If he had been dealing with a serious matter this disturbance in the orderly progress of thought would be a hindrance to ready understanding, but in this instance the entertaining of two so incongruous ideas in the mind at the same time, under circumstances not requiring an effort at harmonization, results simply in an overflow of energy without any outcome in adjustment.

135. The conclusion we reach is that for the needs of adjustment experiences must get reproduced in the sequences in which they originally occurred, except that in the case of assimilation, groups of experiences may fuse with one another instead of the various events following on after each other. In the most efficient minds this is the way thinking proceeds. Things are brought together only as they have some organic connection—only as they may be adjusted to in the same way. But a more unstable mind will catch up with some accidental correspondence between similar elements in two widely different complex systems of events, and be whirled off on to a side track.[1]

[1] I have made no reference here to the distinctions now urged by some psychologists between recollection and recognition; it does not seem essential for my purpose, and the genetic aspect of the subject, and the neurological also, are so much in the dark that it has not seemed advisable to take up the matter. Both recollection and recognition lead to adjustment. Bentley (Amer. Journ. of Psych., 1899) speaks of the recollective consciousness as giving remote adaptation; this recollective consciousness makes use of the memory image, and is later in development than the recognition consciousness, which does not make use of the memory image in recognizing presentations. His view is in accord with Flechsig's theory of association-centres which develop much later than the sense-

§ 2. The Abridgment of Experience in Learning.

136. As experiences increase, effective adjustment demands some method of condensing or abridging them so as to secure economy in the mental life. We have already seen some such a plan in operation; when the child conducts himself toward all the members of a group as he does toward some individual thereof with which he has had experience he is making use of a very economical device. Think of what would be required of him if he had to learn *de novo* every object he came in contact with. In earlier times it was thought that in the learning of things in this way the learner drew off the common characteristics from a number of individuals in which they were embodied, and organized them into a new thing which was called a concept, or general or abstract idea, which differed from the percept, among other ways, in that it could not be imaged. It really did not exist "except in thought." There is nothing in the world, it was said, to which a concept exactly corresponds.

centres, and through which the recollective process takes place. His experiments upon mutilation of the association-centres, which result in a destruction of recollective memory, while direct recognition does not seem to be affected, apparently establishes a vital difference between the two. However, to repeat, if direct recognition and recollection both occur for the purpose of securing adjustment it is not material to our present needs to discriminate between them.

The reader is referred to the following for a detailed discussion of this topic. See Chap. on Recognition in James, Principles of Psychology; Höffding, Outlines of Psychology; Stout, *op. cit.;* Wundt, *op. cit.;* Baldwin, Mental Development, Methods and Processes.

This view, while it recognizes the general tendency toward the abridgment of experience in development, yet it does not seem to conform precisely to the facts of the mental life, nor does it meet fully the requirements for adjustment. It is plain enough why the learner should group together things which possess attributes in common; but it is not apparent how an idea which has parted company with the world to be reacted upon, could help a person in his dealing with this world. For purposes of efficiency, it is true, all irrelevant particulars in the things we come much in contact with must be ignored. We must take account of just the vital characteristics in situations; but always internal processes must be a counterpart of the external order of things. If the concept or abstract idea be looked upon as the result of a kind of process of natural selection among experiences then its function in adjustment is easily understood. It is not something disjoined from the world of realities; but many of the less important details of experience with these realities have been reduced to an inconspicuous place in the idea-complex. Nothing is abstracted in the sense of wholly separated from realities, but there is a process of abridgment or sugaring-off constantly going on, with the result that a more highly concentrated product is being secured, but it is always just the sugar that was in the mental sap originally.

137. The concept or general idea, or abstract notion, appears gradually, as we should expect, upon the repetition of experiences with many individuals possessing certain similar attributes, and which are reacted upon in much the same way. "The progress

of intellectual growth," says Maudsley,[1] "is a progress from the concrete and simple to the general and abstract—from the feeling to the image, from the image to the idea, from the simple idea to the complex idea, from complex ideas to abstract conceptions; thereupon the general or abstract term becomes the sign of a class of perceptions or conceptions, is used as a convenient representative unit or substitute for them, like an algebraic symbol, and functions as such in subsequent mental operations. When we wish to know the true meaning of the abstract, to test rigorously what it actually represents, we must always go back to the concrete; and when we do that we find that in the last resort it represents the mode of affection of an individual by an object or a class of objects, and his special mode of reaction to the object. That is his apprehension of it, which apprehension or mental *grasping*, be it noted, includes movement as a constituent element, is not, as commonly implied, receptive only, but is also reactive—a bi-polar event, sensory and motor."

138. The general idea in order to be of service in adjustment must comprise in more or less generalized form, differing of course with individuals, those characteristics of a group of similar objects that have come to be considered by the individual as the things which are of real moment to him. These general ideas with their accompanying adjustments, come, then, to constitute the individual's mode of regarding objects. Economy compels him to disregard relatively unimportant details in things; he must get to deal with them with reference to what is funda-

[1] Body and Will, pp. 30, 31.

mental and really vital. This must be what Hodgson has in mind when he says: [1] "No object of representation remains long before consciousness in the same state, but fades, decays, and becomes indistinct. Those parts of the object, however, which possess an interest resist this tendency to gradual decay of the whole object. . . . This inequality in the object—some parts, the unresisting, submitting to decay—others, the interesting parts, resisting it—when it has continued for a certain time, ends in becoming a new object."

Take, for instance, the learning of the apple. All individuals present certain similar attributes, or they appear to be so to the learner, and they call forth always the same sort of reactions. Each apple has individual peculiarities, too, doubtless, and these tend to excite appropriate responses, and so to leave behind them distinct mental images for future use in adjustment. But these individual peculiarities appear so infrequently, relatively speaking, that they get swallowed up in the complex of impressions and associated channels of discharge,[2] established by the impressions and reactions which are most often repeated. There comes in time to be established a sort of drainage system, with a main stream into which flows all the water falling in the region. Now when one thinks of the system it is the principal stream that holds his attention, and the smaller streams occupy only the fringe of consciousness. So with the apple, it is the common qualities in all individuals

[1] Quoted by James, Psychology, Briefer Course, p. 262.

[2] Cf. Ziehen, *op. cit.*, pp. 180 *et seq.*, and 184 *et seq.* Also Binet, The Psychology of Reasoning, pp. 184 *et seq.*

that have been especially meaningful for the organism, and so they, organized into a complex whole, have gained first place in attention, and have determined the manner of reaction.[1]

§ 3. The Function of Conventional Language.

139. There is another factor which enters into the development of abstract ideas which people often overlook, with the result that they go astray in their efforts to trace the history and discover the components and connections of these abstract ideas. It is a simple enough fact, that when the child is learning an apple he hears the people around him using the word which designates it; and in time he comes to pronounce it himself, and later to see it, and still later to write it. Now the auditory word and the visual word are but certain kinds of auditory and visual data about the world, while the spoken word and written word are forms of reaction thereupon; and in due season these data and reactions become organized with all other data and reactions related to the apple, and the whole forms a complex reactive system.[2]

As experiences with the apple increase the verbal

[1] Cf. Speer, Arithmetic, pp. 18, 19; cf. also Ward, *op. cit.*; pp. 76, 77; Guyau, Education and Heredity, p. 109; Titchener, An Outline of Psychology, pp. 266, 267.

[2] When the word is revived in consciousness it tends, of course, to bring up the complex with which it has usually been associated, whether rightly or otherwise. A boy reading in Eggleston's history of the early explorers came across the statement, "the tracks that went straight to the camp," and in recitation said, "the railroads that went straight to the camp."

factors, especially the auditory and visual forms, are continually repeated, while only the common or universal characteristics of the object itself as they are apprehended by the individual are constantly presented. As soon as the word is understood it is used when the object is not present to the senses, though of course the latter is reinstated more or less completely in memory. But it can be seen that as the child goes on in his learning, the word being constantly repeated in a concrete way, and the object only reinstated, that the word would grow more and more prominent in consciousness, and the object would slowly disappear. That is to say, the verbal elements, because of their more frequent repetition for one thing, tend to become more and more prominent reminders, so to speak, of accustomed reactions. They have always been found in company with certain other things, data about the world and response thereto, and the organism comes really to know them by the company they keep. People who are never seen apart from one another get connected together in our thought so that when we see one we look naturally for the others. We get into the habit of dealing with an individual as though he could not be separated from his friends; we have to invite them all to our parties if we invite any one; we expect they will take the same attitudes toward questions of religion, politics, etc. So one expects always to find any given word in a certain complex of experiences, and he gradually acquires confidence in reacting on the word largely without looking up all its associates.

140. And then the need of economy in dealing with the world makes it very necessary to get some way

of dealing with things with the least possible attention and effort. Adjustment to an increasingly complex environment requires that consciousness be relieved from looking after the minutiæ of the adjusting processes, the aim being to reduce to the lowest terms the degree of attention required for reaction upon familiar situations, so that opportunity may be had to learn new things. It seems obvious that if any organism continued to be engrossed with every act it performed in the same conscious way that it was at the start, it could not get much beyond the amœba stage, where every activity, no matter how often repeated, demands the use of all the powers of the creature. Quantz, in studying the psychology of reading,[1] sees many evidences of this abbreviating process in the functioning of the human mind, and he is led to the view that the development of mind requires that processes, once conscious, be handed over to the subconscious mechanism, so that consciousness may be left free for the acquisition of higher powers and the performance of tasks more difficult.

Economy in mental effort in adjustment is met by the word taking upon itself the office of reinstating the adjustive process without reviving all the impressions and conscious processes which were experienced in its evolution, and with which the word was originally connected.[2] There must be a sort of short-

[1] See the Psychological Review, Vol. II., p. 36.

[2] Cf. Titchener, *op. cit.*, p. 208, note on "verbal association." In another place, p. 273, this author states the case in this way: "The word idea, which originally served to clinch a simultaneous association of other ideas, tends to replace these; our memory of past events is very frequently nothing more than the reproduction of the form of words which we have

circuiting process, speaking neurologically, whereby the path of nervous discharge gets established from the word directly to the motor-centres instead of continuing to pass through the various sensory-centres which were originally active. Or it may be that the discharge continues to pass over the original course, but this becomes so deeply grooved that the energy reaches the desired point without any supervision on the part of consciousness. Bagley [1] has found that "the apperception of auditory symbols involves the presence in consciousness of visual and verbal ideas mainly; *i.e.*, the conscious 'stuff' of the auditory symbolic apperception is made up in large part of visual and verbal (visual-auditory-kinæsthetic) sense elements. The auditory and kinæsthetic elements (apart from the rôle which they play in the formation of the verbal idea), seemingly form but a small part, and the temperature, taste, and smell elements a still smaller part of this 'stuff.'" Baldwin in discussing this general subject maintains [2] that an object of perception is assimilated either to the "memory copy," or to some symbol, word, or otherwise, which comes to stand for it. The child has acquired the power of reacting to the latter; why should not that answer for the other as well?

141. The process of abbreviation and symbolization goes on still further. The adjustment to the apple results in the establishment of a certain complex of

associated with them; we say that we 'remember' hearing Patti sing twenty years ago, when all that we really remember is our statement of the fact."

[1] *Op. cit.*, p. 30.

[2] Mental Development, Method and Processes, p. 308.

experiences, the details of which may at first be quite prominent in the attentive consciousness, for this is the only way in which adjustment can be secured. When one is learning a certain reaction upon a situation attention is occupied with discovering which of a large number of possible actions are appropriate on this occasion. When the reaction becomes well established the stimulus yielded by the situation will set off more or less automatically the right adaptive responses. It is really the function of the attentive consciousness to take charge of reactions until they attain this degree of automatic facility. The focus of consciousness is the assembling room where the sensory and motor elements of adjustment are put together to make the proper reaction complex.

In every adjustment there is, of course, a feeling element, or rather accompaniment. We cannot conceive of the organism having any experience which would exert absolutely no influence upon the feelings. But as with the attention, so with feeling—when an adjustment becomes easy and assured the feeling element usually becomes more and more subdued, until it passes gradually into just a mood or disposition of the organism. So we get something like an apple mood, a mother mood, a teacher mood, and so on in respect of everything we are thoroughly familiar with. And now the word has all along been one of the elements of the complexes denoted by apple, mother, teacher, and the rest; and as condensation proceeds it happens easily that the word comes to reinstate little else than the mood, and the other elements of the complex may not rise above subconsciousness at all. The principle here involved is illustrated in

the reactions produced in one when under certain circumstances he hears such words as "murder" or "fire" or "help" or the like. These reinstate no definite images but yet they throw the organism into an attitude which is often distinctly painful. Such terms as "virtue," "modesty," and "justice," on the other hand, will beget an agreeable tone; and in all cases there is, of course, a prompting to some sort of action in accordance with what has been done in the past under similar circumstances.

142. So the word as an element of a complex of sensory, ideational, and feeling processes which have issued in definite adaptive reactions has gradually gained the power to set off those reactions on its own motion, according as the other elements in the complex disappear from the focus of consciousness in all every-day experiences. If, then, you say to a child of nine or ten years of age who is fond of Baldwin apples, "What about a Baldwin apple?" there is an immediate response directed toward getting one, but it is highly improbable that there is in this case[1] distinct or focal imaging in any modality. In this typical instance there has been given to the word sort of delegate powers; it is authorized to act for the community which it represents; to be spokesman for its fellows who remain silent in the councils in which they are concerned. But it must be true to the interests of the community, or it will be called to account. The

[1] Without question there must be revived in this case a general pattern of gustatory, visual, and kinæsthetic contents corresponding to the individual's experiences with Baldwin apples, but the point is that this pattern is not focal; it is not apprehended attentively.

affairs of the mental life, like the affairs of government, are carried on by a relatively small number of representatives who reflect the needs and wishes of their constituencies.

As life grows more and more complex the symbolizing process must become more and more prominent, and it is doubtless true, as many philosophers have declared, that the most highly developed people think the most largely in abstract (verbal) terms. One whose sphere of adjustment is narrowly limited, who has learned but relatively few things, may perhaps get along well enough if his thought is largely a representation in greater or less detail of concrete experience. He is not in need of any abbreviated mode of utilizing such experience in his adaptations to the world. Of course it is understood that verbal symbols are empty and meaningless except the realities which they represent have been actually experienced. Symbols as such have no absolute value for adjustment. The mere memorizing of words, so that one can vocalize them when seen or heard, or reproduce them graphically, is of no consequence whatever in dealing with the concrete situations which they denoted to those who made them. The child who is put to learning the dictionary in the belief that he will thus acquire the knowledge and skill which the words it contains symbolize will make little progress in mastering the world. This "Noah's-ark" method of learning will not work. It fails because it does not discriminate between real and symbolic worth; it disjoins things which were never meant to be separated; it assigns to a word independent value; whereas it is of account only because of its associations.

143. We have certainly overestimated the value of the dictionary in leading the learner into a knowledge of the nature and constitution of his environments and his relations thereto without coming into direct contact with them first. Yet we should not overlook the fact that the learning of language in the right way does enable the individual to participate in the life of the race. But he must first gain the typical concrete data which give to the words the content which racial experience has put into them. And the more thoroughly language becomes genuinely representative of actual experience the more efficient it is. It must be possible always to translate language into concrete terms if desired, and of course we must be able to use it accurately and readily for the guidance of conduct; but it is enough for adaptation ordinarily that we should get the general significance of the word,—realize its general application, and not follow it out into its detailed references. The principle involved here is illustrated when one listens to an address. He finds that the flow of words makes a certain general impression, and at the conclusion of the lecture its purport has been appreciated so that it could be embodied in practice, but the thought may not at any point in the discourse have run out into definite images.

Suppose a patriotic man of the times to have been listening to Lincoln as he delivered his Gettysburg address. He would certainly have been thrilled by his discourse, as we are told his auditors all were on that great occasion. But the speaker moved along far too rapidly to admit of his hearers imaging the situations he described; and yet at the conclusion a certain effect had been produced upon their conduct.

His words all awakened some response, but it was in the way of stimulating moods and tendencies to action which had been aroused whenever were received the verbal stimuli which had previously set them off on many occasions. These moods and tendencies were all of the same temper; they each influenced the organism in the same way, so that the effect was cumulative. This accounts for the phenomenon of only moderate enthusiasm during the first part of the address, but tremendous enthusiasm at its close, a thing to be witnessed very frequently when an orator is moving a body of people to action.

If there was in Lincoln's audience, however, a person who had never heard of patriotism; who was unfamiliar with the great struggle which the speaker was describing; who had never felt any devotion to his country—such an one would not respond enthusiastically to what was said, except as he caught the fever of those about him, or was stirred by the orator's voice and manner. But the words *per se* would produce no reactions, save verbal ones, where they simply reproduce themselves in synonyms. It is doubtless true that one always seeks to read some meaning into the words he hears. If they are familiar they immediately put the organism into an appropriate attitude toward the situations to which they relate, but if they are strange then an effort is made either to identify them by substituting for them words that are known, or to carry them down into the realities which they denote, so that one may adapt himself aright.

CHAPTER XII.

APPERCEPTION AS THE ESSENTIAL PROCESS.

§ 1. The Method of Apperception.

144. I LOOK out of my window and detect something moving through the air which I say is a bird. I react to the object as a bird before I really apprehend many of the details from which I must have, originally at any rate, gained my knowledge of the thing.[1] As I reflect upon the matter I appreciate that there must have been incorporated in my appre-

[1] Pillsbury (American Journal of Psychology, Vol. VIII., p. 373) describes a similar process in the recognition of a word as a whole before the separate elements are apprehended. "Here the further question arises, How can we explain this peculiar phenomenon that the words come to consciousness before the separate letters, and is able to work upon them while they are being read? We have seen that the length and general appearance of the word played an important rôle in reading, while but a very few of the letters themselves were read at the first glance. This gives a clue to the puzzle. There is an association between the general form of the word and the word as a complex of motor, auditory, and visual sensations in connection with other objects of perception. When the word is exposed this association is effective at once and calls up a word without the least reference to the tendencies at work between the letters. It is the word that results from this process which exercises supervision over the connection between the letters."

hension of the object data of color, form, movement, and what may be called data of environment. These data as a complex have in the past denoted this thing; I have reacted to them in certain definite ways, prominently in later times by giving them a name. These reactions have in all instances brought me into a certain kind of relation with this object, and gradually the attentive consciousness has been drawn off from the adjusting process, so that in time the sensory elements set off the appropriate reaction more or less automatically. And eventually some one group of data as those of movement will be sufficient to reinstate the adjustive attitude.

145. But I do not know what bird it is and I am eager to ascertain. It alights on a tree and I strain my eyes to discover whether it is one of a dozen varieties that inhabit the trees on my lawn. Now I catch a bit of color that makes me think it is an oriole; but while I am looking I discover a movement which leads me to think it is a robin, and so I am in doubt. But suddenly a clear, musical note flashes out upon the air and the question is decided; it is an oriole. Now what process has my mind been passing through? To begin with, I am impelled to find out just what bird it is in order that I may know what to expect from it; I am restless if I do not know. If it is really an oriole then I shall keep my ears open, and perhaps I may get a song from it; and I would be equally pleased to get a good view of it. If I can find where its nest is I shall pay a visit to that tree occasionally and look and listen. This desire leads me to observe now this mark and now that one, in the hope, born of the experience in hunting birds, that I may detect certain

characteristics which have always in the past been connected with a particular species of bird. When I got the first glimpse of that golden color there was reinstated momentarily the oriole consciousness, or possibly mood. I felt the effect of it in my whole being; I was all expectant of joyful sounds and a pleasing sight. But the next moment the robin consciousness was awakened, and there was a somewhat different attunement of the organism. Finally the song established the oriole reaction so strongly that all the others were completely inhibited. This new thing became *apperceived*[1] by an integrated, solidified body of old experiences with similar objects. And this instance is, of course, typical of most of the adjustments which I am called upon to make in my daily life.

A simple experiment or two will illustrate a particular phase of the process under discussion. When one looks upon these few lines (Fig. 4) he "sees" a ladder, a tree, and a man, as he says. Now, of course, these lines reinstate experiences the observer has had with the objects suggested, and he really "sees" far more than is presented to the organ of sight; he *constructs* these objects out of his experience. And there is in this construction much more than mere visual elements; there are motor and organic elements

[1] The term Apperception is used in a somewhat different sense by different writers, but it is used here in the Herbartian sense. See De Garmo, Herbart and the Herbartians, chapter on History of the Idea of Apperception. See also Lange, Apperception; Stout, Analytical Psychology, Vol. II., chap. 8; Baldwin, *op. cit.*, pp. 308 *et seq*; Pillsbury, *op. cit.*, p. 3; Bagley, *op. cit.*, p. 24; Harris, Herbart and Pestalozzi Compared, Ed. Rev. May, 1893.

that have been connected with climbing ladders or trees, or falling from them. A person who "loses his breath" or gets dizzy climbing a ladder will experience a trace of these sensations when he looks at these lines. One who always goes bounding up a ladder and finds exhilaration in it will feel a tingling in his muscles, as it were, to repeat the process. And these instances are but suggestive of other motor and organic phenomena that occur when one interprets these lines as tree, man, ladder. The same thing in principle happens when one gives his attention to the lines on the left side of Fig. 5. He says he "sees" a duck's head; but he constructs it largely out of his experiences. In most cases his construction will contain, in greater or less detail and explicitness,[1] an auditory element (the quack), visual elements (the waddle, swimming, pond of water), a gustatory element (flavor of the duck's flesh), and a motor element (the vocal word *duck*, at any rate, and probably more); and in in-

FIG. 4.

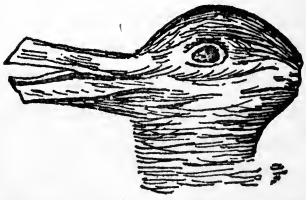

FIG. 5. (From Witmer's Analytical Psychology, Ginn & Co., Publ'rs.)

[1] I have tested young children with these pictures, and upon seeing the duck's head they often imitate the quack and the waddling. They hop like a rabbit, bark like a dog, and so on when they see their representations.

dividual cases there will be other elements, depending upon individual experiences. Turning the attention now to the right side of the figure, one sees a rabbit's head; he recognizes it as such because there are reinstated more or less fully the motor and organic processes that in past experience have been connected with an object presenting certain of these visual data. The duck consciousness and the rabbit consciousness are distinctive, because they comprise not only different visual, but also different motor and organic elements, and so, of course, the objects are not mistaken for each other; they are discriminated, that is to say.

146. Now let us see what occurs when one comes in contact with things which are not readily understood. I have frequently shown classes of students a Hyomei Inhaler (*A*, Fig. 6), and I have found only a few in any class who had previously seen it or anything very closely resembling it. At first sight every one interprets the thing in one way or another, although the interpretation is apt to change several times before the mind comes to rest upon it. As Titchener says,[1] there can be no complex presented to us that will be so utterly unknown and strange that we will not recognize it as something—as a machine or some sort of a plant, or something else. One student thinks of a cigar-holder, another of an ink-well, another of a physician's thermometer-case, and so on. But as each looks

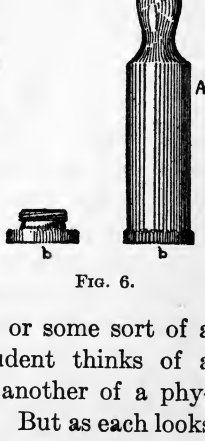

FIG. 6.

[1] *Op. cit.*, p. 271.

more intently he discovers marks which lead him to think it is something other than he first guessed. After a time, and while the students are still trying to place the object, I let them handle it. They set to work manipulating it, and discover that the ends (*a*—*b*) screw off, and this gives them an entirely unexpected datum. They look into it and see it filled with gauze, and this settles the doubts of some but not of every one. Finally, the doubtful ones test it by the sense of smell, and the mystery is cleared up for all who have had any experience with menthol or the like. This odor has always been an element in a complex of medicines and apparatus for inhaling, and this thing must be designed for that purpose. Nothing precisely like this has been seen before, but still it possesses so many characteristics that belong to the class of inhaling things that it is appropriated by the latter, and dealt with on that basis.

147. But there have always been some students who had not previously experienced either the visual or the olfactory data presented by the object, and so they had really to learn it practically *de novo*, although they knew it was made of rubber at least. Those who were familiar with the thing withdrew their attention from it as soon as they glanced at it, for the whole situation was then easily understood; but those to whom the whole thing was new examined every phase of it with care, seeking to gain all possible experiences with it. These persons were learning—just as does the infant who is constantly being placed in situations which he must get to understand in all their possibilities, so that he will know what to expect from them—what total influence they will exert upon his organ-

ism. Accordingly he experiments with them in every way in which they can affect him, and he is careful to get the signs by which his experience with them may be inferred in the future without having to repeat his experiment, if this is not desired; or if it is desired, so that this may be known and no opportunity to enjoy it be let pass.

148. Suppose we take a situation which is typical of most of those that are met with in all school work. Let a pupil be set to prove the proposition that the sum of the interior angles of a triangle is equal to two right angles. How will his mind work upon this? At the outset he constructs his figure, or images it; and as he looks, now at the lines and now at the angles, there come up before the mind's eye propositions he has already proved that constitute elements of this more complex one. He sees certain truths in this problem because he has seen them in other problems. So really this proposition is apperceived through others, not as a whole in precisely the form in which the elements were learned, for this really constitutes a new situation, in its assemblage of parts at any rate. It is an aggregate of elements that are known individually, and the learning of this proposition consists in organizing these elements into an organic whole, and establishing this as a distinct thing in visual, verbal, and perhaps other terms.

Suppose, again, a student be asked to solve a complex algebraic problem. He will be required to analyze the problem to discover relationships between factors which will reveal the meaning of certain at present ill-understood quantities. In proceeding with this analysis every step will be taken in the light of

experience with similar though simpler situations in the past. As he attends to the problem before him he discovers that it is composed of elementary problems with which he is familiar, and he arranges these in a new pattern or design, as it were, and so he "proves" the new proposition. And if we take any situation in arithmetic or grammar or physics or politics or education, we will find that what we are trying to do in solving it is to get it into terms of our present understanding[1] of things more or less closely related to it.

149. It is evident that in assimilation a new experience modifies the old reactive system with which it

[1] Baldwin states the case as follows, speaking from the standpoint of the reactive rather than the ideal processes: "In the light of their motor effects," he says, "we are able to say that the assimilation of any one element to another, or the assimilation of any two or more such elements to a third, is due to the unifying of their motor discharges in the single larger discharge which stands for the apperceived result. The old discharge may itself be modified—it cannot remain exactly as it was when it stood for a less complex content. So this larger discharge represents the habit of the organism in as far as both the earlier tendencies to discharge belonging to these elements of content are represented in it; but it also represents accommodation—*i.e.*, if the assimilation, apperception, synthesis, is smoothly accomplished—since it stands for a richer objective content. Presentations are associated by contiguity because they unite in a single motor discharge; by similarity, because both of them, through their association with a third, have come to unite in a common discharge. The energy of the new presentation process finds itself drawn off in the channels of the discharge of the old one which it resembles; the motor associations, therefore, and with them all the organic and revived mental elements stirred up with them, come to identify or unite the new content with the old." —*Mental Development, Methods and Processes*, p. 309.

has become assimilated. A child who is familiar with the varieties of apples known as Russet, Baldwin, and Northern Spy, will understand to a certain degree, though not precisely, how he is to conduct himself toward a Greening when he sees it for the first time. But when he has eaten the latter he will have acquired a new item of experience which will be annexed to his apple complex in a general way; and its effect, of course, will be to make reaction in the future more definite in respect of this particular variety of apple, but not of all varieties. It is not apparent, as some theorists would have us believe, that reaction upon Baldwin apples will be affected by an experience with Gillyflowers—and why should it? How would adjustment be promoted by such a plan? Modification of old complexes by new knowledge is of the nature *of extension with regard to just the phases of the environments to which the new knowledge relates*, and not to every sort of thing. An Indian could not learn how to get along with white men any more amicably by cultivating acquaintance with the cannibals of the islands of the sea, though he might class all under the term "man"; nor could a child learn more about the domestic cat by having experience with the wild variety.

If, however, a new experience should happen to be quite neutral, having no special meaning for the organism, it would have little if any effect upon the apperceptive system. The individual would not give it special attention, for it would not be important that he should adjust himself to it in any special way; he would simply let it pass. One can see, though, to illustrate by citing an instance of an opposite sort, that

whenever a child gets a new top, which spins better than his old one and so affords him greater pleasure, it will not be long before he has studied it critically, and he will ever afterward strive in every way to get this variety. And so it holds in respect of every new experience in the learner's life; he assimilates it to old systems, but he constantly expands the old complex as the new presents necessities or opportunities for adjustment which the old did not offer. And the very fact of its being new implies that it will exert a somewhat different effect upon the organism from the old.

The most important form of assimilation occurs, of course, among idea-complexes themselves. We often speak as though this process of apperception had to do alone with the reception and disposition of incoming impressions. When they are once in they remain quiescent where they are placed, except as they assist in their turn in the reception of new-comers. But such a view, it is hardly necessary to say, is highly erroneous. Many of us spend most of our time striving to *organize our ideas;* for long periods we get no new impressions from without to which we give attention. We endeavor to discover relationships between impressions and complex systems already established. I find myself now scrutinizing the elements of certain notions relating to the human mind, and I pass in time to other notions and do the same thing, that I may discover a bond of unity that I have never seen before because I did not have these elements in the focus of consciousness near together. But now when I have them in attention at practically the same moment I feel their similarity, and the one of less attachments

gets assimilated into the system to which the other belongs. The greater part of my mental activity, perhaps, is concerned with this discovery of relationships between ideas of all degrees of complexity and organizing them into systems, thus securing the solidarity of the inner world. This organization in certain minds—Aristotle's, Kant's, Spencer's, for example—attains a degree of complexity quite beyond the power of the average mortal to conceive, but the *method* of attaining it is always the same in all minds.

§ 2. Sagacity in the Apperceptive Process.

150. The success with which the efforts of any person striving to solve his particular problem will be rewarded will depend upon his keenness in discerning in it just the essential characteristics which determine its individuality. Of course anything may be viewed from a great many standpoints; various attributes may be taken account of, all of which are real, but some of which are not material to the purpose to which the thing is to be put at the time we are considering it. This complex of characteristics must be broken up and just those elements selected that are really vital to the present needs. Or, to state the matter in the words[1] of James, "we must be able to extract characters, not any characters but the right characters, for our conclusion. If we extract the wrong character, it will not lead to that conclusion. Here, then, is the difficulty; *How are characters extracted, and why does it require the advent of a genius*

[1] Psychology, pp. 362, 363.

in many cases before the fitting character is brought to light? Why cannot anybody reason as well as anybody else? Why does it need a Newton to notice the laws of the squares, a Darwin to notice the survival of the fittest? To answer these questions we must begin a new research and see how our insight into facts naturally grows.

"All our knowledge at first is vague. When we say that a thing is vague we mean that it has no subdivisions *ab intra,* nor precise limitations *ab extra.* But still all the forms of thought may apply to it. It may have unity, reality, externality, extent, and what not —*thing-hood,* in a word, but thing-hood only as a whole. In this vague way, probably, does the room appear to the babe who first begins to be conscious of it as something other than his moving nurse. It has no subdivisions in his mind, unless, perhaps, the window is able to attract his separate notice. In this vague way certainly does every entirely new experience appear to the adult. A library, a museum, a machine-shop, are mere confused wholes to the uninstructed, but the machinist, the antiquary, and the bookworm perhaps hardly notice the whole at all, so eager are they to pounce upon the details. Familiarity has in them bred discrimination. Such vague terms as 'grass,' 'mould,' and 'meat' do not exist for the botanist or the anatomist. They know too much about grasses, moulds, and muscles. A certain person said to Charles Kingsley, who was showing the dissection of a caterpillar, with its exquisite viscera, 'Why I thought it was nothing but skin and squash!' A layman present at a shipwreck, a battle, or a fire is helpless. Discrimination has been so little awakened

in him by experience that his consciousness leaves no single point of the complex situation accented and standing out for him to begin to act upon. But the sailor, the fireman, and the general know directly at what corner to take up the business. They 'see into the situation'—that is, they analyze it—with their first glance. It is full of delicately differenced ingredients, which their education has little by little brought to their consciousness, but of which the novice gains no clear idea."

151. But this power of analyzing, this sagacity, depends primarily[1] upon experience and conforms to the principle of apperception. The ornithologist discerns the essential characteristics in birds in order that he may classify them. The farmer discerns just the characteristics in his corn and potatoes which indicate when he should cultivate them. The physician discerns just the manifestations of his disease which indicate what the difficulty is. And in all these instances the ability to pick out the essential thing is dependent upon large experience in which just the essential things have been frequently observed and

[1] I say primarily, for without doubt the power of co-ordinating attention upon a situation has much to do with determining one's ability to deal with it, and this power will doubtless be different in degree in two persons, even though they have had the same experiences. It is probable that experience is more active in an apperceptive way in some persons than in others, although really the scatter-brains cannot be said to have experience in the true sense. Again, individuals doubtless differ with respect to the groups of ideas that are most persistent and lively, this difference being due in some cases to heredity and in others to variation. For example, one person may be visual-minded, another auditory-minded, one may be mathematically-minded, another musically-minded, and so on.

appreciated.[1] For a novice, one thing is as essential as another, and the whole is a confused, indefinite, ill-defined aggregate; but the expert has already seen the essential characteristics in a certain bird, or in a certain disease, or in a certain mechanical situation, or in a certain business situation, and he can detect them now and ignore irrelevant matters which obstruct the vision of the ignorant in these fields, though they may have the learning of Solomon in all things else.[2] In fine, one can see into a complex situation now if he has seen into something like it before, which implies that he has seen into, in all this means, the elementary situations of which this complex one is, so to speak, constructed. A problem can be resolved deliberately only when the factors entering into it have been previously handled with success.

152. Suppose a civil engineer and a layman to be

[1] "The story is told among the students of Professor Bell, of Edinburgh, who, as everybody knows, is the original of Sherlock Holmes, that he one day astonished his students by declaring that a patient who had just come to the Infirmary, and whom none of the students, not even the professor himself, had ever seen before, was a non-commissioned officer, lately pensioned off, after serving some time in a certain island in the West Indies. The age of the man, his bearing, the angle at which he wore his hat, certain peculiarities of his civilian dress, accounted for the profession and rank of the patient; the West Indies and the certain island were indicated by the marks of the bite of a certain insect which is found only in that island. It is obvious that however much the students had observed these marks they never could have guessed the island apart from this very special bit of knowledge."—Adams, *op. cit.*, pp. 143, 144.

[2] See an interesting example of the principle here involved given by Max Müller, Science of Thought, p. 8.

standing on the bank of a river, each desiring to throw a bridge across it. The former at once sees his way through his problem; the present situation awakens within him many remembrances of similar situations to which he has previously adjusted himself, and which spring forward to guide his action in the present. But the layman is helpless. Unlike his companion he has no equipment in the way of images, in all this term implies, of styles of bridges, various materials, and the modes of organizing them into an organic whole so as to fit into a given situation. In the expert's mind there are completed wholes, rivers and bridges, many of them, and the river before him simply slips into, as it were, the place of one already there, and becomes a part of a pre-existing whole, and he is ready to work out the other part as he has done on previous occasions. No matter what adjustments he may have made to other phases of his environment, if they do not relate intimately to the things before him they will be of little value to him now. So the botanist sees much in the plant at his feet because he has had such intimate and vital association with it in the past that now as he walks abroad every plant he sees fits into some plant pattern or system, and so acquires a meaning. But the mathematician, or the linguist, or the minister, or the lawyer, who has not had the botanist's experience would, of course, not have his power of dealing with the plant world. On the other hand, the botanist would stand confounded before a page of figures indicating operations in higher mathematics, while the mathematician would instantly construct the figure which these denoted, quickly comprehending the spacial or time relations which they symbolized.

A physician is helpless enough before a room full of forty healthy children needing to be taught; the infinite variety of data, all running easily into explanatory and reactive systems in the teacher's mind, utterly bewilder the man of medicine; while the teacher is equally incompetent in the presence of a man requiring medical or surgical treatment. And the principle is universal.[1]

[1] As the expert in anatomy can take a bit of bone and construct the animal from which it came, so the expert in any field can take a single fact in that field and construct the complex situation of which it is always a part. Adams quotes (*op. cit.*, pp. 158–160) Steinthal to the effect that, "In a railway-carriage compartment sit in lively conversation half a dozen persons totally unacquainted with each other. It is a matter of regret that one of the company must get out at the next station. Another remarks that he particularly likes such a meeting with totally unknown folks, and that he never either asks who or what his travelling companions may be, or tells on such an occasion who or what he himself is. Thereupon one of the company says if the others will not say what they are, he will pledge himself to find out, if only every one will answer him a quite irrelevant question. This was agreed to. Taking five leaves from his note-book, he wrote a question, and handed one to each of his companions, with the request to write the answer upon it. After they had given him back the sheets, he said, as soon as he had read an answer, and without reflection, to one, 'you are a scientist'; to another, 'you are a soldier'; to a third, 'you are a philologist'; to the fourth, 'you are a political writer'; to the fifth, 'you are a farmer.' All admitted that he was right. Then he got out and left the five behind. Each wanted to know what question the other had got, and behold one and the same question had been proposed to all. It ran—

"What being itself destroys what it has brought forth?

"To this the scientist had answered, *Vital force;* the soldier, *War;* the philologist, *Kronos;* the writer, *Revolution;* the farmer, *A boar.*"

§ 3. Syllogistic Reasoning.

153. We have reached the conclusion then that in every new situation one searches for characteristics which he has found in situations to which he has learned to adjust himself; and common-sense psychology maintains that this is attained through the process of deductive reason. When one is confronted by any situation, it is said, he will gather up all of his experience relating to it and state it in the form of a proposition; as, using the classical example—*Man is mortal.* Then he identifies the present man, *Socrates*, with the general notion, *man;* then he concludes that what is true of all men must be true of any one man as Socrates. He "subsumes the particular under the general," says the logician, and he knows that what is true of the general must be true of all things included therein. But enough has been said already to show that in his adjustments one does not make up his mind what to do in any situation in a syllogistic fashion, except as we view the matter *ab extra*, when we think we can discern stages through which his thought must have passed before reaching its terminus.[1] A logical, formal analysis of reaction processes makes explicit what is but implicit in all such processes. It makes parts and stages and sequences in a phenomenon that is a unity, that is indivisible, that can not be said to have temporal sequences at all.

154. To illustrate, let us see (what perhaps has been already seen in principle) what actually occurs when a year's old child sees his mother and tries to get to her.

[1] Cf. Ward, *op. cit.*, p. 77.

The moment she appears within the range of vision there are set agoing in the child activities which have brought him happiness in the past. Old experience reacts upon this new datum to interpret it, to give it meaning, and to put the organism in right relation toward it. If one confines his attention to the purely intellectual part of the process he will find that it consists in first an impression from without awakening an image of some sort which it resembles, or with which it has been connected in some way in experience; and then this image arouses a train of others with which it is associated by contiguity (using the term in a general way here) and this results in the new-comer getting properly placed in experience.[1]

When one looks at the matter from the genetic standpoint he sees that in the individual's reasoning upon any subject there are processes which suggest the syllogism. When the child is becoming acquainted with any object or situation he passes through a period where he has some difficulty in placing or interpreting it readily. You can see him looking at it and apparently studying it out. Some say that when he does this he is consciously constructing his syllogisms, and trying to get his conclusions therefrom; when he hesitates about making friends with a strange man, and studies him critically, as is the way of children, he is gathering up all his experiences with men into major premises, then presenting the man before him in a series of minor premises, and drawing his conclusions. If

[1] See Ziehen, Physiological Psychology, chaps. 8, 9, 10; and especially Binet, Psychology of Reasoning, translated by Whyte, for a detailed exposition of this method of stating the view presented above.

most of the reasoner's conclusions indicate that the stranger is a good man, he will then decide to trust him; if his conclusions point in the opposite direction he will keep away from him. It is acknowledged that this syllogizing is not conscious, especially as the child gets better acquainted with this man, for then as soon as he sees him he takes a certain characteristic attitude toward him. In this latter case all the steps are taken so easily and quickly that we are unable to mark them off from each other; but still it is said the syllogism is implicit if not explicit in all this reasoning.

But we can explain the phenomena of the mental life more satisfactorily on the principle stated above. When the child deliberates before a situation—when he studies it—he is simply trying to get some sign from it that will tally with the signs of situations to which he has previously adjusted himself. This studying attitude is produced largely automatically. Given a situation of some familiarity, but yet the individual can not determine how he should react upon it, and he will give his attention to it in a sort of reflex way. This is essential, of course, in order to get from it the stimulations necessary in order to determine what to do with it. When the child hesitates in going to the strange man he is lacking evidence that this man will treat him as his father does. The resemblance to the father is not strong enough to overcome the instinctive fear incited by any strange object. The word "strange" implies that the object does not present stimuli like familiar objects. If it has some resemblance to things that are known, it has other characteristics that do not accord with anything that

has been experienced; and as long as there is this condition of uncertainty the individual will assume the attentive attitude in order that he may expose himself to all possible stimulations from the thing that he does not know what to do with.

To take an instance from the more complex affairs of life—when a young man comes to college from a home or a community where he has been taught that dancing is evil, and finds all his classmates dancing, and he is debating with himself whether he ought to do it, he is regarding the situation in the light not only of the teachings of his own home but of other homes and other communities and of literature and history; and as long as he is uncertain, he cannot put the question aside—he must keep the attentive attitude until some certain course of action seems to be indorsed. If he finds sufficient warrant in the data he has gained from history and literature and other sources to overcome the objections of his parents, he will dance. If he cannot do it the paternal training will prevail; but in any event there will be some conflict. The desire to assimilate himself with his environment will be urging him on, but the home training will tend to inhibit him, and he will feel strain and tension until he gets himself readjusted to the new.

155. Doubt arises, of course, when there is conflict in the advice which various experiences give regarding the conduct befitting present circumstances. This line of experiences counsels one kind of action, while another line suggests a different course, and the opposing suggestions and impulses inhibit one another. Doubt is brought on, too, when the present situation is so obscure that the child cannot discern clearly its main

qualities, or when it presents prominent characteristics that he has not seen in the things he has adjusted himself to previously, while presenting others that seem familiar. These cases are illustrated admirably in the lives of children when they are brought in contact with strange people, or carried to strange cities where there is no clear resemblance to the corresponding things at home, the possibilities of which they have learned. A child will stand before a stranger, to return to our example, halting between running to him and running away from him; his face shows the struggle going on within between trust and distrust. Now he discerns characteristics which, in the people with whom he is familiar, have denoted disagreeable traits; now he detects others which in some people that he knows have stood for kindliness and sympathy. What will the child do then in his predicament? Perhaps he will see some characteristic of facial expression, or bodily movement, or tone of voice, which was recently exhibited by the person who whipped him, and he will flee to his father. Perhaps the expression he sees on the face of some bystander will determine his action. Possibly the physical environment will tend to make his trust or suspicion stronger, or there may be various other factors which enter into his deliberations. But, however this may be, the motive for his halting is that his past experience gives him conflicting counsels regarding his action in the present.

156. Then there is the other form of reason which educational theory has laid so much stress upon—that which is concerned with inferring a continuous order of things from observing a few individual instances. We may take for illustration the classic example of

the rising of the sun. The child soon comes to feel that the sun will rise every morning, and the logician says that in arriving at this conviction he passes through a process of argument something like the following: the sun has risen every morning since I was born; what has been true of these mornings will be true of all mornings; therefore the sun will rise every morning in the future. Now, most of the child's life is, of course, expectant, anticipatory in a certain sense. He believes that if he behaves himself in a particular way his father will treat him in a certain manner, his mother in a certain other manner, and his playmate in a still different manner. He knows that if he touches the stove it will burn him, if he pulls the cat's tail she will scratch him, and so on *ad libitum*. How does he come to pre-adjust himself in this manner to situations? Is this a form of assimilation, of adjustment, to future situations in the light of past experience? What else can it be? In the words of Stanley,[1] "it is plain, indeed, that if the future is to be apprehended at all, it must be in terms of the past. To interpret the unknown and unexperienced, to conceive it in any manner, the mind must use the terms of experience. Even the rapt dreams of the mystic is a piece-work of experience. Now, experience is itself a consolidation of elements, a series of groupings, established by frequent coalitions; hence it follows from the nature of experience that the more frequently an event occurs with certain associations, the more strongly we expect it to occur."

Future events are in a sense but deferred present

[1] Mind, new series, Vol. XV., p. 363, "The Evolution of Inductive Thought."

events; in reacting to them they really become present in an ideal way, and are dealt with as though they were present in a concrete way. When I think of the sun rising in the future, what does the content of consciousness at the moment relate to? To the experiences I have had with the sun, of course; and my attitude will be just that which experience has developed—that is, I will believe the sun will rise next year or a hundred years hence. I may, of course, be able to see other events that will make the first one different from what it was in times past; but even here I am expecting these latter events to act as they previously have done and to the same effect, which will modify the former events. Or again, as I look forward, and am conscious of a certain amount of time elapsing before the event occurs, my fears and my desires tend to make a particular view of the thing prominent. I will see it happening or not happening according as my emotional state makes this or that mental complex supreme. To be optimistic means that the things I see in the future are reacted upon by complexes of experiences that are associated with a predominantly pleasant mood; to be pessimistic means that future events, contemplated ideally, are reacted upon by complexes of experience that have a predominantly unpleasant mood; but in any case what happens in inductive reasoning is the taking of an attitude toward coming events in the light of past experience.

CHAPTER XIII.

THE DOCTRINE OF FORMAL DISCIPLINE.

§ 1. Exposition of the Doctrine.

157. The doctrine that particular experience gives power of adjustment to particular situations only, and not to all sorts of situations has not in the past been made the basis of educational theory to any great extent; but rather one quite contrasted to it has been employed. It has been held that it is possible to develop by formal exercise a strength of mind, a power or vigor or vitality, a sharpness or keenness which may be put to good use in any emergency. Like the muscles the mind as a whole grows and acquires strength and capacity in every act it performs. Special kinds of action, as solving problems in cube root, will develop skill in dealing with every situation in which one is placed, as in deciding the merits of the free-trade controversy, for example. If a boy is to become a lawyer, to illustrate, it is maintained that he will need to be good at reasoning, for one thing; then in his preparatory training this "faculty" must be disciplined by some sort of material, it makes little difference what, only so that the exercise is secured. The special offices which men will fill in mature life, the special obligations which they will assume, are not to be taken account of specially in the school. No matter what

they will be called upon severally to do they will stand in need of efficient mental action—ready perception, faithful memory, accurate reason—and they must be practised in these ways upon whatever stuff can be conveniently got together for the purpose. Adams mentions[1] an old book on Algebra that the author styled "The Whetstone of Witte," evidently believing that this subject makes a very good grindstone for sharpening the faculties, and almost every subject of instruction has been and is lauded by its devotees for a like reason.

158. This doctrine grows naturally out of the conception of living things which people form in their unreflective contact with the world. They see, as they think, that muscles gain strength through vigorous exercise; they cite the blacksmith's strong right arm as evidence. And the reverse of this seems also to be true; inactive muscles become puny and ineffective. Moreover, muscular strength gained by work of any sort may apparently be employed without loss in every kind of muscular work, however different from that in the doing of which the muscles were developed. If I go into a gymnasium and tone up my biceps by the use of dumb-bells, the strength I thus acquire may be utilized in whatever way I choose in the affairs of life—in pitching hay, in batting a ball, or in pugilistic events. The body is thus a sort of reservoir of energy; whenever and however any is generated it flows into this reservoir and may be drawn upon for every purpose.

People then pass on in their speculations from things physical to things mental, and say that the mind grows

[1] *Op. cit.*, p. 110.

as the muscles do; that it accumulates force in the same way, and expends it on the same principles. Mental work of any kind develops a fund of mental power, skill, keenness, force, or whatever it should be called, that may be utilized for the performance of any task. Fouillée voices the current opinion of the Disciplinarians when he says,[1]—"We can learn to build a railway by rule of thumb, but those who invented railways did so by the *force of the intellectual power* they had received; it is therefore *intellectual force* that we must aim at developing."[2] This author lays great stress in all his educational theorizing upon the development of the *form* or *method* of mental action. It is not the *content* of the mind that should concern us but its *form*. He does not wish to give the pupil in the school experience with the special things with which he must deal in real life. He cares for the *mode of procedure, the way of attacking things* which can be attained, he thinks, by a regimen of formal training.

§ 2. The Doctrine in the Light of Every-day Experience.

159. The physiological principle upon which the doctrine of formal discipline is based is seen upon examination not to be quite true as it is generally stated. Muscular activity which is concerned with particular employments and undertakings does not beget a power that can be expended without loss in the accomplishment of any task whatsoever. The oarsman cannot turn all the energy he develops in

[1] *Op. cit.*, p. 38.
[2] The italics are mine.

rowing to good account in pitching hay or pulling beans or shoeing a horse or carrying a hod on his shoulder. The pugilist cannot employ without loss in another form of occupation the brawn gained in his training. No particular form of muscular activity, in short, can be made to yield power that can be utilized in other ways without some waste. And why? Because rowing, for example, calls into play in definite combinations muscles and their energizing nerve centres which are not co-ordinated in precisely this way in any different activity.[1] Besides, looking at the matter neurologically, the cerebral processes behind every action become ever more facile with repetition. Paths of discharge are established, and energy passes along them ever more readily, so that less and less escapes by the way into channels not in the system.[2] And the outcome is that this special

[1] Students who have passed much of their lives out of doors in manual labor on a farm in a flat prairie country often come to the University of Wisconsin, where they are compelled to climb a hill to attend their classes, and it takes a considerable period for their lungs and muscles to become adapted to the changed conditions. Recently I spent one month in the mountains of Utah, tramping with men who had always been climbing mountains. In outward appearance I would be thought the hardiest of any of the group, but any one of them would "walk me off my legs" in two hours. Running around all day on flat ground after a golf ball, or a plough even, will not put one in perfect condition for mountaineering.

[2] Cf. the following: Baldwin, Mental Development, Methods and Processes, chap. 5; Bair, Development of Voluntary Control, Psychological Review, Vol. VIII., p. 474, September, 1901; Bain, Emotions and Will, pp. 304 *et. seq.;* Spencer, Psychology, Vol. I., pp. 496 *et. seq.;* Sully, The Human Mind, Vol. II., pp. 189 *et. seq.;* Kirkpatrick, Development of Voluntary Movement, Psychological Review, Vol. VI.

activity becomes easier with practice and more and more can be accomplished through it as time goes on. Practice of a special kind gives increase of power of a special kind, that is to say. But now, a new art or dexterity demanding a new set of muscular co-ordinations, and requiring the development of new cerebral correlations and processes, cannot profit greatly by the skill gained in the first activity, for it cannot make use of the mechanisms by means of which the former art, strength, and facility were obtained. Particular forms of exercise in this view, then, are seen to have special and not general value except in a limited sense; to give power only in the special fields in which the exercise has been gained, and not in all fields indifferently except without great loss.

The point is that the standard of efficiency in muscular action is not so much one of brute strength as of precise correlation, which achieves any task with the least wear and tear. And every performance has its characteristic complex of co-ordinations, muscular and neural, which gets established so that it can function in an automatic way only upon continual repetition in precisely the same manner every time. So that the skill which one develops in drilling on a certain activity is apt to prove of relatively little advantage in emergencies requiring new correlations. Of course, mere brawn, as people use the term, is a sort of substrate of all muscular pursuits, and it can always be utilized in a certain measure, no matter from what source it is derived. So rowing increases lung capacity, among other things, and a sprinter stands much in need of wind, so that if an oarsman should take to the track his experience on the water would be of some

assistance; but still, and this is the crux of the matter, the policy of developing skill in running by practice in boating would be exceedingly bad economy. There are a few physiological effects of any form of exercise that would come in handy in any other; but again there are some results from using the oars, for instance, that would contribute nothing of value in sprinting or boxing.

160. Those who profess to believe in the virtues of formal mental discipline are still not willing to carry it to its logical conclusions. They will not say that any particular sort of mental activity will benefit the mind on every side. They maintain rather that the training of perception in any direction improves the power of perception in every direction, but not the power of reason, or memory, or imagination. Here the theory that all possible mental functions are benefited in the same degree by any variety of experience is abandoned, and it is implied that there are various departments, as it were, to the mind, from each of which may be produced special articles of mental merchandise according to the needs of the moment. We cannot draft the power developed by exercising the perceiving faculty, for instance, into the service of the remembering faculty; nor can power of memory be utilized in carrying forward reason or imagination. And the development of the intellectual faculties does not exert great influence upon the emotional life. Love increases only by being called freely into action; reasoning in geometry will not stimulate it. Indeed one often hears the Disciplinarians say that the undue exercise of the intellectual parts of the mind dwarfs the emotional and spiritual powers. Instead, then, of

particular experience giving strength to every faculty it often has exactly the opposite effect—it weakens certain powers. Love for all things though is cultivated by love expressed for some particular thing, say the formalists; but loving much does not nourish hope or reverence, or courage; much less anger or envy or pride. These different aspects of the soul must be developed by special and appropriate kinds of experience. The formalist cannot fail to see in concrete life that in a given situation the mind functions in a way appropriate thereto in perceiving or reasoning or remembering or loving or hating, while under other circumstances it conducts itself in a different manner according to the needs of the organism. And no matter how much training one has had in dealing with a special kind of situation, as in mastering Greek grammar, he is not helped much, if any, by virtue of this experience alone when he is called upon to decide how a dependent wife or child or parent shall be cared for.[1]

In the affairs of daily life people have always observed that competency in one field does not assure keenness in all fields.[2] There comes to mind the classic

[1] Since the above was written I have read an article by Thorndyke and Woodworth (Psychological Review, Vol. VIII., p. 247, May, 1901), giving the results of experiments to determine the "Influence of Improvement in One Mental Function upon the Efficiency of Other Functions," and they fully indorse the principle set forth above. I quote this significant sentence, "The Mind is . . . on its dynamic side a machine for making particular reactions to particular situations."

[2] If the theory were true that perceiving in one field makes observation keener for everything. then the study of psychology, requiring such sharp vision, ought to result in filling one's

example of Napoleon discharging La Place from his cabinet on account of inefficiency, although the eminent mathematician possessed one of the "strongest" minds of his age. Hinsdale quotes[1] Macaulay on the possibility of turning legal acumen to account in handling even closely related subjects. In speaking of lawyers, he says that, "Their legal arguments are intellectual prodigies, abounding with the happiest analogies and most refined distinctions. The principles of their arbitrary science being once admitted, the statute-book and the reports being assumed as the foundations of reasoning, these men must be allowed to be perfect masters of logic. But if a question arises as to the postulates on which their whole logic rests, if they are called upon to vindicate the fundamental maxims of that system which they have

mind with accurate percepts of all things with which he has daily intercourse. Adams expresses (*op. cit.*, p. 136) his view of the matter in the following fashion: "A whole class of students of psychology has been reduced to the most shamefaced confusion when suddenly asked to write down, without time for investigation, the answer to the question: 'How many buttons have you on your waistcoat?' This state of matters is greatly to be deplored, and a certain section of practical educationists give us many opportunities to grieve over it. When a class in school has been floored by some such simple question as, 'With which foot do you usually begin to walk?' or, 'At which end does a recumbent cow begin to rise?' those practical educationalists turn to the teacher, and, with a deprecatory smile, ask if it would not be better to pay a little more attention to the 'observing faculties' of the pupils. (It is to be noted that the term 'practical' is used here in a peculiar sense.)" Cf. Bolton, Training in Observation, Journal of Pedagogy, Jan., 1901, pp. 227–237; also Thorndyke and Woodworth, *op. cit.*, p. 249.

[1] Studies in Education, p. 53.

passed their lives in studying, these very men often talk the language of savages or of children."

161. Keenness then is a special matter; it can be put to good use only in the special situations in which it is developed. The mathematician will be keen in his way but not of necessity in every way. Practically speaking, he can see keenly in a present situation provided he has had much luminous experience with similar situations; he can remember well things that are concerned with this special kind of activity, because they are essential to the continuance thereof; they are *used* in the adaptive process. He can discern accurately the relations between things in this field because his mind has operated in this way heretofore while he was becoming a mathematician. It has become organized with reference to this phase of the environment, where peculiar relations must be perceived in order that adjustment may occur at all.

The principle is well illustrated in the training of the lawyer (to mention him again) who is disciplined in weighing circumstantial evidence of a certain special character,—"an artificial thing created by legislation or custom, with the object of preventing the minds of the jury—presumably a body of untrained and unlearned men—from being confused or led astray. Moreover, they are only familiar with its use in one very narrow field—human conduct under one set of social conditions. For example, a lawyer might be a very good judge of circumstantial evidence in America, and a very poor one in India or China; he might have a keen eye for the probable or improbable in a New England village, and none at all in a Prussian barrack. A wild Indian will, owing to prolonged obser-

vation and great acuteness of all the senses, tell by a simple inspection of grass or leaf-covered ground, on which a scholar will perceive nothing unusual whatever, that a man has recently passed over it. He will tell whether he was walking or running, whether he carried a burden, whether he was young or old, and how long ago and at what hour of the day he went by. He reaches all his conclusions by circumstantial evidence of practically the same character as that used by the geologist, though he knows nothing about formal logic or the process of induction."[1]

This principle is seen to be at the bottom of much of the phenomena of our daily lives. Put out into the world a grammarian of great attainments in his own specialty, and observe his reactions upon it; what does he see keenly? Not the æsthetic values of

[1] Hinsdale, *op. cit.*, pp. 53, 54.

The experiences of "Sherlock Holmes" as a detective show that ability here depends upon special kind of knowledge instead of formal reasoning power. "It was not," Adams says, "because Holmes could reason backwards that he beat the ordinary Scotland Yard detectives. When one of them, Lestrade, saw the letters R-A-C-H-E- traced in blood upon the wall, the only idea that rose above the threshold of his consciousness was the word *Rachel*, and he at once came to the conclusion that a woman of that name had something to do with the crime, and proceeded to make a hypothesis that would fit into this fact. He reasoned backwards as easily and as accurately as Holmes himself, the only difference being that Holmes's apperception mass contained the German word *Rache*, which means *revenge*. Holmes was right, Lestrade was wrong; but it was not a matter of knowledge. Like Bain's wild beast, Lestrade sprang upon Rachel, because *Rache* did not present itself."—*The Herbartian Psychology Applied to Education*, pp. 149, 150.

objects which the artist would detect; not characteristics in a plant which would attract the botanist; not the activities of human beings which the psychologist would perceive; not the happenings in trade circles which the merchant would have in mind; not the evidences of disease which would engage the attention of the physician. No, he would be quite indifferent to all these phenomena, and they might almost as well be non-existent so far as he is concerned.

Of course no grammarian would be utterly unconscious of these other things, because no one could be just a grammarian and nothing else; his early training, the exigencies of daily life, his contact with people who have different interests,—these even if he had no explicit training in other directions would make him something more than a mere specialist. But the more his experience has been limited to grammatical situations the more will he ignore other aspects of the world; and the principle holds for the specialist in every subject. The minister sees things in his way, the teacher in his way, the anarchist in his way, and the king in his way. Each may be marvellously keen in his special line, but be blind as a bat in apprehending truths which other men see clearly enough.

§ 3. The Development of Force by Formal Discipline.

162. The ambition of formalists always is to "develop mental force." But what is mental force? and how is it generated? It may be regarded from one standpoint as referring to endurance in labor, to long-sustained effort. In this view we think of the capacity to do much work without injury, the

ability to continue at a task for a long period without fatigue; and this matter relates to the production and economic expenditure of neural energy in the support of the perceiving, remembering, reasoning, and other mental processes. From another standpoint mental force may be considered as referring to the efficiency of the mind as an instrument of adaptation, to its readiness and keenness and trustworthiness in dealing with the things which are presented to it,—the reliability of memory, the accuracy and subtlety of reason, the freedom of imagination, the vigor of will, the buoyancy of hope, the faithfulness of conscience. Still again, we may think of mental power as denoting a body of habits which should be manifested in the varied activities of daily living—habits of persistence in the performance of duty, of attention to uninteresting tasks, of critical study of all situations before reacting upon them, of suspended judgment until all the evidence is in,—those habits which we all feel are requisite for anything like success in the business of life.

Can these ends, all of which are of the utmost consequence in education, be attained by formal training? Can power in any sense in which the term may be understood be generated in doing one thing and employed with equal success and advantage in doing something different? It is well understood now that mental activity utilizes cerebral energy; and when the supply is reduced beyond a certain point fatigue ensues, the machine runs down,[1] so that it is of vital importance that a good stock of nervous force be kept always on tap for the support of vigorous mental action.

[1] See my Aspects of Mental Economy, chap. 1.

But how is cerebral energy generated? The neurologist tells us that it is produced through the exercise of cerebral cells,[1] which increases both the anabolic and catabolic processes from which force is derived. But it must be remembered that, for the most part at any rate, particular mental activities occur in particular departments of the cerebral cortex,[2] so that

[1] Cf. Donaldson, *op. cit.*, chap. on Education of the Central Nervous System. See my Bulletin, *op. cit.*, for a detailed treatment of the subject.

[2] The doctrine of Localization of Function is accepted, I think, by all scientists. The literature of the subject is very extensive, but see Donaldson, *op. cit.*, chap. on Localization of Function, for a statement of the modern view; also Flechsig, *op. cit.* Munk, Ferrier, Horsley, Schafer, and others have contributed experimental evidence corroborating the theory in its fundamental features at any rate. Just to what extent and in what regions the higher mental activities are localized are matters of dispute, but pathological evidence seems to show that linguistic, musical, mathematical and certain other functions are localized in special areas. Cases, as the celebrated Blind Tom, are on record where individuals were practically idiots in everything but musical ability. Baldwin (Mental Development, Methods and Processes, p. 440) gives some suggestive facts bearing upon this general topic, and so does Grant Allen, Vol. III., p. 157. Wyllie (on the Faculty of Speech, part 3) and Bateman (Aphasia and the Localization of the Cerebral Speech Mechanism), have shown that the mind may be intact in most of its operations, but lose the power of speech or writing or understanding language. One reads every now and again of an arithmetical prodigy, all of whose forces seem to be expressed in the direction of this special activity. The superintendent of the school for the feeble-minded at Chippewa Falls, Wis., has pointed out to me inmates who were normal in all but some one characteristic, and he believes that this is due to some defect in a particular region of the brain. It should be added that he thinks a de-

not all cells are stimulated in every psychic act; and the question which concerns us is whether the energy-generating capacities of one area which has been duly exercised can on occasion be called into requisition to help out neighboring regions which have lain dormant in the meantime.

The experiences of daily life ought to give us data relating to this subject, if we can only interpret them aright. Can one employ, without loss, energy generated by physical exercise in the support of mental activity, and *vice versa*? Are people who excel in physical endurance equally superior in mental endurance? Is the blacksmith capable of applying himself to difficult book work for long periods? Is the scholar, on the other hand, the man who has been generating and utilizing his energy in *thinking*, able to do a hard day's work at the forge or in the hayfield? Think of Plato or Aristotle or Kant or Herbert Spencer carrying a hod or swinging a sledge all day! I am not speaking now of *exercise* in the sense in which this term is commonly used. Doubtless a certain measure of motor activity favors mental action, for without it the organism gets out of repair, and its energy-generating capacities are reduced. But we must keep in mind the laborer, who can apply himself to hard manual work for ten hours a day year in and year out,—can he use his energies in doing the scholar's work, or the scholar use his energies effectively in doing the laborer's work? No, the man who has been working with his muscles can now work much more easily and effectively with them than with his mind; while the

fect in any cerebral area tends to "weaken" the whole structure.

one who has been consuming all his energies in the elaboration of ideas can continue to so employ them more advantageously than in using a hoe or shovel or axe. Students who come to the university from the farm say that it takes a considerable period to get the energy which has been energizing muscles shunted into other channels. So, too, when a man who has been excellent in his studies leaves the university for an agricultural life, does it not take him some weeks to become adapted to muscular pursuits?

163. What is thus seen to be true regarding the employment of energy derived from physical activity for the support of mental effort, and the converse, must hold to some extent at least, in respect of the transference of force developed in the production of one kind of mental labor to another of a different sort. Mental activity in a certain field, we must suppose, leads to the organization of the parts of the cerebral mechanism involved. It opens up connections between stations in the given circuit, and continued exercise renders the transit from one point to another ever more easy and expeditious. The study of mathematics, for instance, involves, speaking neurologically, the development of those central nervous processes that are connected with adjustment to the quantitative environment. Such study reduces resistance to the passage of energy along the associative highways which ramify through the mathematical field, connecting impressions together, and relating the whole to the appropriate reactive system. That is to say, the more mathematical thinking one does, the oftener he adapts himself to the quantitative environment in either an ideal or motor way, the more easily he can

do so in the future in terms of energy required, and the more he can accomplish for a given amount of energy expended.

This neurological view is certainly borne out by the phenomena of daily life. We observe a boy learning the elements of arithmetic, algebra, and geometry, and struggling hard over his tasks. A vast amount of energy is expended in accomplishing little, for the reason that his thought does not go straight to the point;[1] and there is besides a good deal of resistance to be overcome in everything that is done because there are so many new associations to be instituted. The most important source of waste is doubtless the failure to conserve energy through utilizing it only in effective ways. The novice does so many things, makes so many movements, thinks so many thoughts that are not directly related to the accomplishment of his task; while the expert has acquired the power of shooting directly at the bull's eye.

But as the pupil goes on in his arithmetical or algebraic work we find that difficulties once so great are more readily disposed of; for time and energy expended he accomplishes more, and when he has mastered any particular subject, as trigonometry, we see that he has acquired the capacity to enjoy himself in this field for hours at a time without fatigue, where formerly a single hour's application might draw too heavily upon

[1] There is a general law apparently to the effect that in the learning of anything there is much excess action in the early stages, and gradually just the required action gets selected out from all the irrelevant performances, and firmly established through constant repetition. Cf. Bain, *op. cit.*, p. 506 *et. seq.*

his resources. See how the accomplished mathematician spends his whole life over his problems, and without too great dissipation of his forces either. And what is true of the mathematician is equally true in principle of the specialist in every department of human activity. The amateur is always prodigal of his resources; he spends a relatively large amount of energy in achieving simple tasks; but with experience, with practice, he learns to save his strength and to employ it to the greatest advantage. The beginner is thriftless for the reason that he does not know how, as we say, to be economical. Learning has for its end, speaking neurologically, to establish a network of just those neural processes that are required for adjustment to any situation, and to close up the channels that in the tyro give a chance for capital to be drawn off into ruinous speculation. Becoming proficient in any study or superior in any skill means, regarded from this standpoint, the selection and perfecting of just the activities, ideal and motor, that are of service in attaining the end in view, and allowing all others to disappear through lack of exercise. So the mathematician and the grammarian and the teacher and the lawyer and the business man, as the fruit of thoroughly mastering their respective specialities, become able to use all their energies profitably in dealing with their favorite themes.

164. The defenders of formal discipline conceive of the brain as a reservoir of energy; they hold that this reservoir may be tapped at any point and its contents drawn off as required to meet any kind of need. Now, our present-day conception of the construction and functioning of the brain would lead us to attach some

degree of validity to this notion, but it has certainly been pushed too far by the Disciplinarians. It is doubtless true that there may be transference of energy from one cerebral area to another. In a certain sense as Flechsig has said, cerebral energy, like water, tends to find its level,—if it be drawn off from one area it flows in from others.[1] But the likening of cerebral energy to water is apt to lead to error. The different regions of the brain are probably not so closely connected that one can be drained fully into the others. If this were so it ought to be that a person could utilize all his energies in some special direction. He ought to be able to apply himself to his mathematics or his law or his psychology until he should exhaust his resources. Now, while it does appear that in a well-organized brain in maturity one's energies can be expended largely at a single point, yet is it not true in a measure of every one that when exhaustion is induced by a particular kind of work, there is still force left for different occupations? College professors who become much fatigued over their customary duties during the year are able in the summer to engage in other activities with much vigor. The engineer greatly enjoys and is rested by reading, while the linguist is refreshed by travel and sight-seeing. The metaphysician whose energies are spent over prolonged thinking of an abstract, introspective character enjoys getting out into nature, and coming in contact with concrete realities. The wearied business man, again, enjoys the opera and music, and the mathematician is glad

[1] Cf. Curtis, Inhibition, Ped. Sem., Vol. VI.; also Breese, On Inhibition; Psych. Rev., Vol. III., and Monograph Supplement.

to spend an hour in "resting his mind" as he says over a novel or a game of whist.

Observe now a youth whose organism is still in a formative condition working at his studies, and see illustrated the principle that force generated by special exercise cannot be utilized wholly in a different line of business. Thoughtful teachers know that young pupils cannot be held with profit to one task for longer than thirty or forty minutes. When the thought channels seem to be clogged up in one field, as in algebra, they may be quite free in another locality, as in history or in manual training. No sensible instructor would attempt to confine a pupil to a single kind of activity until he had used up all his available capital; such a proceeding would result alike in squandering vital force and in making poor use of valuable time. So the reservoir theory of cerebral energy breaks down when the analogy with physical things is carried too far. It fails to take account of the fact that the cerebral mechanism is not constructed after the pattern of a well or a receptacle for liquids of any sort; it is not designed for storage at all, but is fashioned on mechanical principles for the utilization of force in various ways, and the plan of its construction determines the conditions under which the energy may be expended to greatest profit.

In every machine there are economical and wasteful methods of operation, and the same must be true in principle of the brain. A given amount of force can accomplish much more in promoting activities in well organized than in poorly organized areas. This does not mean, of course, that energy generated in one way cannot be used at all in other ways; but it does

imply in its practical bearings that an individual should be required to perform during his learning period those activities which he will be called upon to perform most often in maturity; he must be practised in doing as an apprentice what he will have to do as an artisan. It would be folly indeed for a learner in civil engineering to devote his time largely to developing energy for his work by the study of the Chinese language. The experience would doubtless be of some assistance to him; but how much more would it profit him to apply himself mainly to those things which would be directly involved in the activities of later years. Of course this is a relative, not an absolute matter; doubtless some benefit can be gained from all activities whatsoever. But the greatest aid will be derived from those special exercises which are concerned with the particular adjustments which one's position in the social mechanism will demand of him. The term "particular," it will be understood, does not refer alone nor mainly to the trade or profession one adopts; it includes his social relations in the larger view, and his intellectual and æsthetic relations to the environing world. But the point is that the study of Chinese or Sanskrit or conchology or calculus or cube root in the hope to make the best preparation for meeting these relations effectively would surely not be the part of wisdom.

CHAPTER XIV.

THE THEORY OF FORMAL DISCIPLINE. (Concluded.)

§ 1. The Effects of Excessive Special Training.

165. It is well known that specialists often arrive at the point where their minds get into grooves, as it were, and they lose their bearings if they come out into the open to take a look around. The voices of truth which come from their own cells are for them full of significance. They know what they indicate, what lies back of them, what is to be done with reference to them; but the voices of truth from other quarters either fall upon deaf ears, or are esteemed to be only meaningless jargon. One is reminded in this connection of Hamilton's well-known statement that the mathematician pure and simple is incapable of dealing effectively with many of the situations of daily life. He gets settled in a particular way of looking at his environments so that he keeps his eyes open always for special characteristics, and in time he cannot see anything else. If he cannot reduce complex phenomena to the form of the equation, he cannot comprehend them. Most of the affairs of human life, however, do not admit of such exact, minute analysis with precise determination of the value of every elementary factor;[1] so that the merchant, the statesman,

[1] Cf. Mill, Autobiography, p. 19.

—in short the "man of the world" must acquire the power of estimating complex situations as wholes, even though there may be a lack of perfect certitude in the premises. There is the business man's "shrewdness," the farmer's "sense of the weather," the teacher's "tact" and "instinct,"—modes of judgment regarding matters which lie beyond the domain of mathematical proof, and adjustment to which could never be secured by mathematical method.

So, prolonged study in a particular field, instead of conferring upon the student the power to deal the better with all other aspects of the world, may, on the contrary, lead to arrest in the development of readiness and efficiency in adjustment thereto. As Harris says:[1] "The law of apperception, we are told, proves that temporary methods of solving problems should not be so thoroughly mastered as to be used involuntarily, or as a matter of unconscious habit for the reason that a higher and more adequate method of solution will then be found more difficult to acquire. The more thoroughly a method is learned, the more it becomes part of the mind, and the greater the repugnance of the mind toward a new method. For this reason, parents and teachers discourage young children from the practice of counting on the fingers, believing that it will cause much trouble later to root out this vicious habit, and replace it by purely mental processes. Teachers should be careful, especially with precocious children, not to continue too long in the use of a process that is becoming mechanical; for it

[1] Report of the Committee of Fifteen on the Correlation of Studies in Elementary Education. Bloomington, Ill., 1895, pp. 25–57.

is already growing into a second nature, and becoming a part of the unconscious apperceptive process by which the mind reacts against the environment, recognizes its presence, and explains it to itself. The child that has been overtrained in arithmetic reacts apperceptively against his environment chiefly by noticing its numerical relations—he counts and adds; his other apperceptive reactions being feeble, he neglects qualities and casual relations. Another child, who has been drilled in recognizing colors, apperceives the shades of color to the neglect of all else. A third child, excessively trained in form studies by the constant use of geometric solids and much practice in looking for the fundamental geometrical forms lying at the basis of the multifarious objects that exist in the world, will, as a matter of course, apperceive geometric forms, ignoring the other phases of objects."

§ 2. The Development of Methods of Thinking by Formal Discipline.

166. But there are those—Fouillée is one—who maintain that the benefit of all study lies in the mental attitude, or method of attacking the world which it develops in the student, and not in the body of ideas which he acquires from it. So if in maturity one should have forgotten all his Latin and Greek and geometry and physics, he would still have gained certain ways of looking at the world and operating upon it which would be of immense advantage to him in all his undertakings. But now, how can method be devoid of content and still have life left in it? When

the mind has lost its images, its ideas, the records of experience, together with the motor memories connected therewith, does it still retain memories of the *way* of doing things that will be of service to it? Can it apperceive new experiences by old *modes*, casting them into certain forms made ready for them by the way in which previous experiences had to be handled? Could we blot out all content from our lives, and still keep systems of forms into which we could run all new experiences? These questions show to what extent material conceptions have determined our way of regarding the mental life, and how figures of speech derived from the physical laboratory lead us far afield in our thinking about the mind. Form without matter, Kant said long ago, is empty; and our modern notions of the manner in which the individual adjusts himself to things certainly indorse this view.

But yet there is seen to be some truth in this view when regarded in a particular light. A pupil may be required to apply himself to geometrical study for a couple of years, and in doing this he gets into a *habit* of attacking things in a certain fashion, and this habit endures even after the special objects, in dealing with which it was established, have disappeared from consciousness, although they are probably never wholly lost. One may think of this as a disposition or direction of movement which the organism falls into and which it tends to remain in permanently by a kind of law of inertia. Our preceding review of the great complexity of the adjustive processes, with the tendency toward condensation as experiences multiply, leaving a sort of mood as the representative of a body of concrete experiences, would be wholly in accord

with the theory that a habit of thought could be established by a particular kind of exercise.

The principle is freely illustrated in the people one sees around him; the mathematician has a certain way of looking at things, the lawyer a different way, and the musician is quite distinct from both. Bring these persons in contact with any situation and they will strive to react upon it according to the method which has been effective in their special activities. And in so far as a certain kind of exercise might give a method of attack which would be more effective in adaptation to a given environment than the method which could be gained by experience in that special field, there would be value in the formal discipline which would result from study of the first sort. If geometry, for instance, develops in the student a habit of reacting upon situations which would bring better results in the work of the statesman or the physician, than the habits which would be developed in the pursuit of their particular branches, then, of course, the discipline derived from the study of geometry would be of primary importance for the statesman and the physician.

But how could this be possible? Is the geometrical attitude better for the psychologist than the psychological attitude? Would it be of advantage to the historian to be got into the algebraic way of dealing with his phenomena? Rather would it not be necessary for him to acquire that way of dealing with things which is established by much experience with historical facts? Again, should the physician come to his work with the attitude of the geometrician? Or is there a peculiar disposition required for the suc-

cessful pursuit of medicine which can be gained only by dealing successfully with the situations in this field? It does not seem that one need remain in doubt about this matter. Neither experience nor theory indorse the proposition that the method acquired in one department of activity is best adapted to another and different department. Good method is simply the attitude of the organism which is most favorable for adjusting itself effectively to a situation. And unless the situations in different fields are just the same, then the methods must vary to suit the differences, and always be adapted to the thing in hand.

167. But this general statement probably needs qualification in this respect—that certain phases of the world are more complex than others, and adjustment to them involves a combination or synthesis of methods. For instance, the phase of the world described by physics is more complex than that described by geometry; in a sense the former includes the latter, and other things besides. In dealing with the situations which physics describes, then, one will employ the method which is developed by the study of geometry. The geometrical method is incorporated, as it were, in the more involved method of physics, and it would seem most economical to have the student familiar with the method of geometry before he undertakes the study of physics. So, too, the method gained in the observation of plant life will be of assistance in observing human life; psychology is far more complex than botany; and in the pursuit of the former the student can utilize the method developed in the study of the latter. So in other studies the method acquired in any given one may be utilized in the study

of one to which it is related but which is more complex.

168. It seems hardly necessary to add that in all adjustment there is demanded a method of attacking situations which will enable one to couple up things that belong together, and keep apart things that are not intrinsically related, and to proceed connectedly from what is clearly understood to what is obscure and needing to be explored. Now, doubtless all experience conducted on these lines will be of some advantage in every emergency; but it must not be inferred from this that any special formal study has peculiar value for the development of habits of thought of this character. If any exception were to be made it would be, perhaps, in favor of logic, the sole aim of which is to indicate the modes of thinking which will give reliable results in all mental processes. Ever since Aristotle's day men have accorded high rank to formal logic; it "teaches one how to reason aright," has been the contention. No one seems to have been more confident of the superior worth of this study than Mill; "I know of nothing, in my education," he says,[1] "to which I think myself more indebted for whatever capacity of thinking I have attained. The first intellectual operation in which I arrived at any proficiency was dissecting a bad argument, and finding in what part the fallacy lay; and though whatever capacity of this sort I attained was due to the fact that it was an intellectual exercise in which I was most perseveringly drilled by my father, yet it is also true that the school logic, and the mental habits ac-

[1] *Op. cit.*, p. 19.

quired in studying it, were among the principal instruments of this drilling. I am persuaded that nothing, in modern education, tends so much, when properly used, to form exact thinkers, who attach a precise meaning to words and propositions, and are not imposed on by vague, loose, or ambiguous terms. The boasted influence of mathematical studies is nothing to it; for in mathematical processes none of the real difficulties of correct ratiocination occur."

Mill is unquestionably right when he says that logic develops a tendency to search out the exact dictionary denotation of words, and analyze propositions to discover whether they belong to this or that class, or violate this or that canon. But there is a difference between dealing effectively with words and propositions according to the rules of the game of logic, and dealing effectively with the world of real things. Formal logic never aided one to see straight into the heart of man or nature; it does not give insight into psychology or physics or medicine or teaching. The prominence of formal logic in mediæval times did not lead men to truth in any field, but rather hindered its votaries from perceiving things as they really were, as Locke said over and over again. "*Non vitæ sed scholæ discimus*" furnished Locke a text for much of his educational writing.[1] The disputations of the mediæval logicians were fruitless enough in real life.[2]

[1] See Quick, Locke on Education, especially pp. 69–77.

[2] "Bacon has given us a picture of a body of men with powerful minds but with little substantial knowledge. He found himself, at Cambridge, England, 'amid men of sharp and strong wits, and abundance of leisure, and small variety of reading, their wits being shut up in the cells of a few authors, chiefly

Formal logic is not so different in principle from chess or backgammon; it has rules of its own, and works well enough in its own territory, but it does not point a way to clear thinking in other fields. One who could deal with the world of realities only according to the method of formal logic would be helpless indeed, for the insight which this study gives relates not to *things* but to *words* and *propositions* on the verbal and formal side merely. The mind reacting upon its environments can without doubt get to apprehend it only by pursuing logical processes; but the point is that it cannot acquire this power by formal training but only by dealing directly with the phenomena to be understood. Every subject has its own logic, and it is always a logic of fact, and not of terms and phrases. A man may be ever so keen in formal logic and a crass blunderer in educational or political or scientific thinking. When formal logic was at its best in an earlier day, superstition and error were also at their best. It was not until men abandoned the "hootings of scholasticism" and came face to face with things and ascertained by actual experience how to deal with them that any progress was made in the discovery of truth. The test of correct logical thinking must always be the result upon adjustment, and this criterion is largely lacking in formal logic.

Aristotle, their dictator, as their persons were shut up in the cells of monasteries and colleges; and who, knowing little history, either of nature or time, did, out of no great quantity of matter, and infinite agitation of wit, spin cobwebs of learning, admirable for the fineness of thread and work, but of no substance or profit.' "—Cramer, *Talks to Students on the Art of Study*, p. 68.

§ 3. The Establishment of Mental Habits by Formal Training.

169. Finally, it is maintained by the Disciplinarians that useful habits may be developed in one line of study and employed to advantage in all studies whatsoever; and habits in this sense are regarded as something different from method in one's thinking. They have in view habits of perseverance, attention, industry, and the like, which, of course, will be serviceable in whatever position one may be placed in life. Successful adaptation to any new and complex situation requires persistent attention in order to discover its essential characteristics. The question now is whether the linguist, for instance, who acquires these habits in the study of grammar can employ them at their face value in whatever tasks he may have to perform in after-life. Will his attention serve him as effectively in the investigation of political questions as in the pursuit of linguistics? Could the linguist apply himself as concentratedly to the study of physics as of grammar?

We have evidence enough in the things we behold about us, it seems, to answer the question with some degree of assurance. Do we not find that the grammarian can attend more faithfully to the facts in his particular field than to those in other fields with which he is less familiar? And why? Upon what do such habits depend? The principle is illustrated in the ordinary habits of every-day life. One gets into the habit of going to bed, we will say, at ten o'clock. When the clock strikes that hour it sets off motor processes

which eventually lead him to bed. A well-known actor has testified that when the clock strikes eight at night his heart jumps forward, and he feels a thrill throughout his whole being. That particular stimulus had for many years been associated with the raising of the stage curtain, which was formerly the occasion always of a good deal of emotional excitement, and now this stimulus automatically reproduces these feelings. And this is what habit requires—the correlation of particular stimulations with particular activities so that the former will produce the latter without conscious effort on the individual's part.

Habits of perseverance, attention, and the like are, of course, of a more general character than those that have been indicated, but they depend upon the same fundamental principle—the establishment of certain reactive processes in response to characteristic stimuli. These are the modes of attack which are of greatest worth in securing adjustment to the situations in question, and so they have been selected and preserved. But being general in character they are applicable to a great variety of situations. One who has got into the habit of sticking to his grammatical book when it is before him until he masters the task set him will be more likely to stick to any book to which he applies himself than one who has not had his experience. But still this habit cannot be transferred without loss. The grammatical stimuli will in themselves have some influence in keeping the individual at his task; there will be a certain amount of compelling power in them. As a test, substitute algebra for grammar and see whether the man will persevere in trying to find out what the stuff before him means. If he is not apperceiv-

ing the algebraic facts as he does those of grammar, how can he attend? Attention is just the mental side of adaptation, and when there is no adaptation there can be no attention.[1] When the boy sees nothing in the proposition before him his mind wanders off on to other topics; just as when a merchant attends a lecture on epistemology he is absent in thought every moment. In the event though that the grammarian can work his way through the algebra he will doubtless be benefited by his discipline in grammar, for in past experience attention and perseverance under such circumstances have brought success, and he feels they will do so now; and this sort of thing is more or less general in its application.

But the formalists make a mistake in assuming that some one branch of study possesses peculiar qualities in developing these general habits. They maintain, naïvely enough, that perseverance and attention acquired in the pursuit of grammar and arithmetic, for instance, will prove generally useful, while these same habits developed by the study of history and literature and botany and psychology will not be so valuable. When you ask the Disciplinarian why grammar and arithmetic are so superior to other studies, he will respond by saying that these subjects

[1] *Cf.* Baldwin, Mental Development, Methods and Processes, chap. 15. Speer (*op. cit.*, p. 3) quotes Maudsley as follows: "How, indeed, can there be a response within to the impression from without when there is nothing within that is in relation of congenial vibation with that which is without. Inattention in such case is insusceptibility; and if this be complete, then to demand attention is very much like demanding of the eye that it should attend to sound-waves, and of the ear that it should attend to light-waves."

develop such fine habits; and he apparently forgets altogether that no one study has a monopoly of habit-developing power. Faithfulness, perseverance, diligence, and the rest, however established, become, in a measure, of general utility, although, as has been pointed out, they cannot be transferred from one field to another without some loss.

170. Again, in the more strictly emotional activities there are habitual attitudes or expressions of a general character that when established by one kind of exercise may be of assistance in situations similar in respect of the kind of reaction demanded, but not so much so perhaps in respect of the content reacted upon. Fear developed in the classroom will tend to manifest itself on many occasions outside; the pupil will be timid in the presence of people wherever he is. It is maintained by the authorities at West Point that courage developed in the training there will stand the soldier in good stead when he is on the field of battle. James speaking of the matter says[1] that, "Pride and pugnacity have often been considered unworthy passions to appeal to in the young. But in their more refined and noble forms they play a great part in the schoolroom and in education generally, being in some characters most potent spurs to effort. Pugnacity need not be thought of merely in the form of physical combativeness. It can be taken in the sense of a general unwillingness to be beaten by any kind of difficulty. It is what makes us feel 'stumped' and challenged by arduous achievements, and is essential to a spirited and enterprising character. The

[1] Talks to Teachers on Psychology and to Students on Some of Life's Ideals, pp. 54, 55.

fighting impulses must often be appealed to. Make the pupil feel ashamed of being scared at fractions, of being 'downed' by the law of falling bodies; rouse his pugnacity and pride, and he will rush at the difficult places with a sort of inner wrath at himself that is one of his best moral faculties. A victory scored under such conditions becomes a turning point and crisis of character. It represents the high-water mark of his powers, and serves thereafter as an ideal pattern for his self-imitation. The teacher who never rouses this sort of pugnacious excitement in his pupils falls short of one of his best forms of usefulness."

But courage and pride and every good emotion can be aroused as readily and effectively by the pupil's study of nature as of grammar, of Shakespeare or Tennyson, as of cube root or the subjunctive mood. And, moreover, an emotion aroused with reference to a particular situation, as when a pupil is frightened when he has a conference with his school principal, will be more active in just that situation than in different ones; the pupil will in the future be frightened more readily by his principal than by the pastor or family doctor. A lawyer might be very much ashamed to be "downed" by a case in law, but yet take easily enough a defeat in whist or golf or billiards, while it would be just the other way round with the gambler or athlete. Professors in the university may have a spirited and enterprising attitude enough with reference to the things in their special fields, but they often exult in not knowing or caring anything about the things in the territory of their colleagues. The law holds here as everywhere else in mental functioning; the attitudes and activities that have been frequently

repeated in reaction upon a situation become ever more ready in recurrence in that situation, but under different circumstances they will be reinstated only in part or not at all. So that to make pride and pugnacity and shame the most effective governors of life they must be stimulated during the preparatory period in the sort of situations they will need to be active in regard to in later years.[1]

171. Perhaps there is demanded a word of qualification of these general propositions regarding formal discipline as they should be practically interpreted to guide education. From what has gone before it might be inferred by some that one group of persons will be required in their daily lives to adjust themselves only to the psychological side of their environment, and so will need to be equipped only with psychological facts; others will need only mathematical facts; still others only zoological facts, and so on. But one would certainly be as much in error in thinking that this real world with which we must all deal constantly is thus divided up into psychological and mathematical and linguistic and legal strata or sections, each marked off rigidly from the others, and every man living his little day in one or the other of these without ever crossing over into neighboring regions—one would go as far astray in acting on such an assumption as the formalists have in conceiving that if one can conduct himself aright in one field of

[1] I have seen men who would face any danger on the football field break down utterly in trying to make a public address. Again, I have known men who would be thoroughly honest in their sports who would not hesitate to lie and cheat in an examination. Cf. Briggs, *School, College, and Character*, Essay on College Honor.

formal materials and relations he can do so in all fields whatsoever. There is danger that we may not fully appreciate the organic character of the environments to which every individual must adjust himself. The environment which history describes is most intimately correlated with the environments which mathematics and psychology and biology and all the rest describe. The world is not partitioned off into departments in any such sense as the titles of studies in the schools might suggest; and one person's environment is shot through in a most complex and intricate way with phenomena described by history and physics and spelling and literature and other studies.

Especially must we not lose sight of the fact that the people about one constitute the most important phase of his environment. Their interests, their social ideals, the thoughts which engage their attention, their opinions of culture, their traditions—everything which goes to make up their daily lives must be adapted to by each individual. He must come to understand all these things and organize his understanding into conduct; so that even if a particular study exercised no influence upon one's relations toward nature or toward his fellow-men in the more serious ethical sense, it might nevertheless confer upon him the most desirable power of being able to participate in the mental life about him. So we cannot think of a person of any degree of development reacting upon his environment in a civilized community, even if narrowly limited, who would not find of service some arithmetical and geometrical and historical and linguistic and botanical and other sorts of knowledge. To say then that any certain study will be of no account in the

life of a person is going too far; but to say, on the other hand, that some formal study will, in the best way possible, make one ready for all adjustments, is much worse. It is a relative matter here as it has been at all points in our discussion; everything will doubtless be of some use, but many things will be of comparatively little account, while others will be of great utility in the life of every individual.

172. Consider, again, that in a social organism one member must have faith in the serviceableness of another whose work is essential to the welfare of the whole, and he must be willing to tolerate him and assist in providing conditions necessary for his greatest efficiency. Especially is this true in our country, where members deliberately determine whether or not one of their number shall be allowed to continue in his work. Shall the state support investigators in agriculture? in medicine? in education? Shall there be specialists to look after the hygienic and other interests of the community? In order to settle such problems wisely citizens must have some knowledge of the questions at issue, at least enough to appreciate the importance of the matters involved. A man's estimation of values depends upon his acquaintance with the things under consideration. What he knows nothing about he esteems lightly; it does not apparently enter into his life, and he cannot conceive that it enters into any one else's life. A highly developed community of pure specialists would be impossible, since one would not harmonize with or in any way favor another. In a faculty of professors one who has never pursued a given study will see little or nothing of value in it. And the university as we know it could never have been

developed if the various professors had not had a broad general training in which they were put *en rapport* with the principal departments of human activity. So, considered from this standpoint too, we must in fitting the child out for membership in civilized society, prepare him for broad and varied instead of narrow and non-social experiences.

CHAPTER XV.

CONCLUSION.

173. It will be in place now, perhaps, before taking leave of our subject, to get a bird's-eye view of the course over which we have travelled. Our inquiry relating to the extent and boundaries of our field, the peculiar composition and character of the soil, and the most effective method of cultivating it have led us to the conclusion that while our province is far from exactly and definitely bounded, still there are certain regions which are occupied by no one else, and which every one acknowledges belong properly to the educationist. It has become apparent that on account of the great complexities presented in our field, greater than those found elsewhere, it is extremely difficult to determine how best to work it. Our survey of the methods which have been employed in times past in treating education has revealed the obstacles and uncertainties which exist therein; and as a consequence widely different doctrines have been preached at one time or another throughout human history, and great names are found ranged on opposite sides of the most vital questions of teaching.

We have seen the necessity of employing methods of precision in our investigation. We must adopt

modes of inquiry that will counteract certain tendencies toward error in our thinking, which incline us all to project out into the world what exists in our own minds and hearts, and then conduct ourselves toward this as though it were the external and truthful order of things. The way to overcome our difficulties lies in the adoption of scientific method in all our procedure, for this greatly assists the investigator in restraining the element of prejudice in his inquiries. We have found that a considerable body of educational doctrine has already been worked out according to scientific method, and there is great interest at present in this work. But still education is far behind most of the other sciences. To supplement his own investigations the educationist must seek help from many sources, since he must deal with extremely complex matters, which in their elements are dealt with in various sciences. He must summon to his aid every science which is concerned with the investigation and description of human nature, either directly or indirectly; and he must strive to interpret phenomena which are yet unexplained in the light of principles presented in biology, in psychology in its several departments, in evolution, in neurology, in ethics, and in sociology. In proceeding in this way he may pursue strict scientific method, since in every science certain fundamental generalizations constitute but hypotheses which are applied to the explanation of occurrences which cannot be directly investigated. So a principle of human nature presented in psychology will become a principle of education when it is employed in the interpretation of phenomena which do not lie directly within the domain of pure psychology, but which are,

nevertheless, psychical phenomena; and the same is true in substance of generalizations of biology, evolution, neurology, and the rest.

174. We have seen that the end of all educational endeavor must be to give the individual a mastery of the world. And when we come to define "the world" we see that it includes not only what people call material things, but there is very much more to it which conditions the well-being of the individual, and toward which he must be led to take a right attitude. We find, indeed, that man's social environment is the most real and vital part of the world to him. In modern civilized life one's happiness depends more upon the character of his relations to his fellows than to material things, and education must seek primarily to adjust him in the most harmonious way to society. Then there is what we have called his intellectual relation to the world; we have conceived that there are intellectual needs that are as real and vital as physical needs. One's welfare is determined largely by his ability to comprehend the causes and rationale of the things with which he has most frequent intercourse. All the evidence points to the fact that the mind of man will react in some way upon the phenomena presented to his senses, and education must lead him to see the universe operating according to law rather than caprice; it must supplant the natural animistic conception of things by the scientific conception. Then again, man sustains relations of an æsthetic character toward his environment, and these are very profound and very real. His well-being requires that he be led to an appreciation of the beautiful in nature and in art, and that there be developed in him the tendency and the

power to remodel his environments so as to minister to his æsthetic needs.

175. Every human being bears these several relations to the world, and they must be perfected by education; but we found that when men are banded together in a social organism they do not all sustain these relations to the same extent and in the same degree of complexity. In order that the social organism may be most prosperous some men need to be masters of complex phases of the world of which others may be wholly ignorant; just as in the somatic organism the eye needs to be more sensitive, more responsive to the environment, to deal with a much wider range of things, than does the foot or the stomach. So in working out our educational régime we must regard a man as a member of a community rather than as an isolated individual, and in consequence thereof we must prepare him for his particular needs determined by the particular offices he will fill in society. Some will perform simple work and their adjustments and their needs will be relatively simple; others will perform very complex duties and they will require much more elaborate preparation therefor. But all have certain needs in common, and our educational machinery must be run in view of this. The several "classes" necessary in society as we know it will each be carried along as far as the present organization of social forces will admit of, or until they are fitted to discharge their peculiar duties efficiently, and adjust themselves in happy relations to every phase of the complex world of men and things which conditions their welfare. The physician must be fitted to do more than mix drugs and administer them. In his contact with

his fellow-men he influences them not only physically but intellectually, ethically, and æsthetically, and in turn he is influenced by them in all these ways. And what is true of the physician is equally true in principle of the lawyer, the teacher, the statesman, the engineer. In short, it holds for every individual, no matter what special work may be engaging his attention principally.

176. Understanding Adjustment in this sense we pass next to consider the method of attaining it as the end of educational effort. We find that mere accidental, desultory, unguided contact with the world does not give understanding or mastery of it. When it is encountered *en masse* in all its complexity it overwhelms the individual, and instead of his overcoming it he is overcome by it. So he must be introduced to it in a certain definite, orderly manner, working in a progressive way from the relatively simple things which he has learned at any period through significant intercourse with them, to closely related and ever more complex things. The educationist then must arrange the world for the individual so that he will be brought into correspondence with it in this manner, else it will ever remain a stranger to him. The ability to deal with any situation depends upon one's having had experience with some similar situation. And the educationist will so plan it in view of this principle that the individual will in his educational course be made ready for those general and special duties which he will perform as a member of a community.

We found that as the individual's experiences increase he resorts to economical devices so that he can use them most effectively in any situation in which he

may be placed. He discovers that it will be of great assistance to him to take any single object as a type of many others, which may be reacted to in the same way. It will be a help, also, to condense his experiences, relegating unimportant characteristics of situations to the background of consciousness. When reaction upon any phase of the environment becomes sufficiently definite and certain, he drops the whole thing out of consciousness and keeps before the eye only those things he has not mastered thoroughly, and which he needs to look into carefully in his dealings with them. Continuing the economizing process he gathers up a whole lot of details of a given experience, attaches a verbal symbol to the complex, and then under all ordinary circumstances he makes the symbol do more or less complete duty for the elaborate thing it denotes.

This phenomenon of human nature, we have seen, has led many people to believe that every experience gives a power of dealing with any given situation whether one's experience has been related to it or not. The doctrine of formal discipline arose naturally enough out of a method of studying mental function which was incapable of showing the progressive stages of generalization, condensation, and symbolization. It was easier to think of the mind as a reservoir of power receiving contributions from all activities whatsoever, and utilizing its resources in support of every activity indifferently. But a little inquiry revealed plainly enough that while particular experiences disappear from consciousness still they never quit the organism altogether; and in their departure they leave no remains of the nature of a general power which can guide

one in any situation unless he has had experience with a similar one.

177. Now glancing ahead we see that upon these foundations the educationist will build. The details of this building must be presented in another volume, but a rough sketch of it may be given here. The educationist will, in the first place, elaborate a curriculum which will be adapted to make the individual *efficient;* which will give him mastery over his social, intellectual, æsthetic, and material environments—a mastery as complete as the position which the individual will occupy in the social economy will allow. What studies will make the individual most capable in his social relations? Plainly those which will give him most intimate contact with men, alike of the past and of the present, in relationships which will be of greatest advantage to all concerned. The educationist will not put subjects in the curriculum that are designed merely to discipline the mind by formal exercise. He will not have pupils spend time over parsing or grammatical forms or cube root or spelling or anything else of the sort which they will never employ in intercourse with their fellows, or in participating in the accomplishments of the race. He will not have them memorize for the sake of discipline names and dates and sizes of armies and the like which are presented in what people have called history. He will exclude everything which does not give very good proofs of its suitability to assist the learner in his relations with men and things, by presenting to him now situations which he will encounter, though it may be in a more complex form, in later life. In the matter of studies purporting to be of social value, for example, the educationist will proceed

upon the doctrine that if the individual can be got to react in desirable ways to social situations actual or ideal during the developmental period, then he will acquire modes of reaction which will be serviceable to him in all times and places. The educationist will cast out everything which cannot return an affirmative answer to the question, Will the individual in mastering you be making in the best way adaptations which he will be required to make as a member of a social organism?

Applying this test the educationist will find that every individual must gain perfect mastery of the means of social intercourse,—reading, writing, spelling, number, language, both native and foreign, grammar, and rhetoric, so far as he is likely to find them of service but no further. If it appears that one who will fill an industrial office in society will be brought very infrequently, or perhaps never, into situations where the mastery of a foreign tongue will be of assistance he will not be expected, much less required, to study it. If it appears that the range of words in his native tongue which he will make use of will be limited to those symbolizing experiences involved in the scope of his particular activities as a citizen and a workman he will not be allowed to waste his time in memorizing a Miltonian or Shakespearean vocabulary. If it appears again that the technicalities of grammar or the formal principles of rhetoric will contribute little if anything to his adjustments—then they will not be found in his course of study. Nothing for mere formal discipline will be the watchword. All these things will be mastered by those in whose wider range of adaptations they will help to solve some problem of a social or

intellectual or æsthetic or physical character. The man preparing himself for work of a relatively simple nature, employing his muscles mainly, and whose social, æsthetic, and intellectual needs will as a consequence be relatively simple, will not be required to master as much of language, reading, spelling, and similar studies as will be of service in the life of the lawyer, the statesman, the teacher or the man of leisure devoting himself to literature, art, and kindred pursuits.

The educationist will take special pains to provide for certain needs of every individual that have largely been overlooked in educational theory and practice. He will have in the curriculum studies which will seek to give all pupils without exception, whether destined for the farm or the pulpit or the mines, a scientific way of looking at the world around them. The time and energy spent on such things as parsing and cube root by a member of the industrial class will be devoted largely to gaining those experiences which will give him poise and balance in a bewilderingly complex world, leading him to see that what at first appear to be lawless happenings, caused by the agency of supernatural beings of an uncertain disposition, are really occurring unerringly in conformity to great fundamental laws. Again, the educationist will investigate all the subjects that are candidates for entrance into the curriculum to determine which of them will best give the individual æsthetic appreciation of his environment, and to such he will assign a place in the course of studies. Finally, he will survey all the materials at his disposal to see if there are any which will enable the learner the better to master his physical environment, which Spencer thought was of first importance

in human life. If physiology and chemistry and physics and botany as they can be taught in the schools can be made to present situations in adapting himself to which the pupil will learn to live the better, then they, too, will be admitted and taught from this standpoint.

178. And then when the subjects are selected there is still left the task of assigning to each its proper place. It is not necessary to say that the complexities of this problem are very great; but it is enough here to add that they must be resolved by the aid of the principles which have been stated. The most real and vital needs must be first provided for, and those of least importance must occupy a subordinate place. Perhaps we shall never be able to work out a perfectly balanced program, one that will precisely meet the needs of every individual put through it, but there is no good reason for being discouraged over this, for nowhere in the universe are needs exactly met without excess or waste, without overdoing or underdoing. In none of her processes is nature uniform in hitting the bullseye. She depends upon it that if she fires in the general direction of the target the majority of her shots will take effect, and the educationist cannot hope to have better success. If he is guided by the principles which have been given he will hit the bullseye in the majority of cases, and no one can do more than this.

179. Finally, these principles will guide the educationist at every step in his method of handling his materials. He knows that he must cause the individual to react in the school in the ways in which he must react outside. He realizes that reading, writing, spelling, number, and all the rest are just means used to facilitate social adaptation, and so he will cause his pupil to

use them in this way at every step in his learning. He will cause them to be gained in the manner in which they will be employed, for this is the only way in which they may become effective in the learner's adjustments. The teacher will not as a rule put a child in a seat and ask him to memorize words, for he appreciates that unless they are acquired in the way of facilitating social intercourse they cannot be so employed later. So, too, the situations in history and literature must be made very real, and the adaptations which they are designed to confer upon the pupil must be actually made by him in the school. The educationist will attach no value whatever to the learning of verbal propositions about conduct, except as these awaken and nourish the actions which they describe and commend. The teacher will be guided by one great principle of method,—lead the learner to actually make the adjustments which the study he is pursuing is designed to perfect. Everything is summed up in this; all devices have value only as they contribute to this end.

180. Again the teacher will know that he must arrange every subject he is to present to his pupil so that it will be very closely related to his previous experience in and out of school. At every point in his teaching he will base what he does upon what his pupil has seen and done; he will not make a logical start in a study, but he will ascertain what the child knows that is related to the subject, and this will indicate where the beginning must be made. His relation to his pupil will be determined wholly by the necessity of the latter gathering new experiences in a certain definite, psychological, economical manner. He will

not make his recitation simply a means of discovering what the pupil has remembered, but rather a means of facilitating his adjustments to new situations, and of making these thoroughly stable and secure.

181. It should be added in closing that our survey has taken little account of the changes which occur in the individual during the process of development which, of course, are of prime importance to the educationist. The principles we have examined, being general, apply as far as they go to every stage of the child's education, but they do not provide at all for particular needs at particular epochs in the individual's career. So the educationist must have at hand other principles which indicate what work is most suitable for special periods in development if he would achieve the end of education in the most economical manner. But it must be emphasized that the principles of mental development will in no way militate against the general principles here presented; they will simply extend them, make them more particular, adapt them to peculiar situations. They will point out when it will be most appropriate to give the pupil any particular experience which will be of service in his adjustments. We say here that whatever the teacher does for the child must help him to deal effectively with men and things, and then mental development will tell us what should be done at any particular season, and how it can best be done at that time. We lay out the general plan now, and the details must be looked into later.

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