A RECONSTRUCTED THEORY OF THE EDUCATIVE PROCESS

WILLIAM HEARD KILPATRICK

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COLUMBIA UNIVERSITY

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By WILLIAM HEARD KILPATRICK
PROFESSOR OF EDUCATION, TEACHERS COLLEGE
COLUMBIA UNIVERSITY

Edition of 1935

BUREAU OF PUBLICATIONS
TEACHERS COLLEGE COLUMBIA UNIVERSITY
NEW YORK CITY

PRINTED IN
THE UNITED STATES OF AMERICA

THE RUMFORD PRESS
CONCORD, N. H.

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IN THE history of civilization there emerge from time to time epoch-making reconstructions of world outlook. Classical Greece furnishes the best-known instance, when that gifted people first in the world brought conscious criticism effectually to bear upon their own culture and so laid the foundations of subsequent Western thought. Another occurred when Copernicus, Galileo, and Newton gave modern natural science to the world and along with it, ultimately, all that we know as modern industrialism. At the present time three such reconstructions are simultaneously under way. Of these the first is Darwinian evolution which, beginning seventy-five years ago, is still, along with other factors at work, remaking our hitherto dominant philosophic, moral, and religious outlooks. The second is the new physics in which we have seen, as it were but yesterday, the foundations of Newtonian physics destroyed by Einstein's relativity and the equally important breakdown of the atom. The third as a movement is still in the making: our industrialism under the impact of advancing technology is demanding such social and economic reconstruction as staggers us to contemplate.

When these shifts of fundamental conception arise, the effects reach far both in scope and in depth. No region of thought or endeavor can escape. Reorganization and reconstruction of outlook and individual and social behavior become imperative. Education, which properly represents both the growing and the conserving aspects of the individual and social process, becomes then involved in the very essence of the reconstruction. If intelligence is to play its proper part in this process, education must itself be remade so that it can respond adequately to the new demands thus laid upon it.

* Reprinted from TEACHERS COLLEGE RECORD, Vol. XXXII, No. 6, March 1931 (Revised January 1935). This article was originally prepared for the White House Conference on Child Health and Protection. In the reports of that Conference it appears, in somewhat different forms, in the summary report of Section III-C (*The School Child*) and in the report of the subcommittee on Summer Vacation Activities.

The task here is limited to one side and aspect of education, namely, the educative process as this is viewed especially from the psychological side. The universe has itself become more fluid than once we thought, more amenable, that is, to human thought and endeavor. Our problem is then how we shall reconceive the educative process so as to allow it better to serve in a world undergoing the reconstructions set out above. Fortunately a reconstructed biology has already given us a promising start.

I. A GENERAL THEORY OF EDUCATION

Conscious education aims to improve life. It must begin then with the world and life and human nature as they are, and find in these the ways and means of making life better.

Our World: Its Mingled Reliability and Uncertainty. Ours is a world of hopes and fears. We have wants, and we struggle to satisfy them. Effort counts, but only within limits. As we study the process, we find that our world develops novelly. Within the process the unexpected and unpredictable are mingled inextricably with the recurring and the predictable. The recurring and predictable we use in our efforts to attain our wishes. But foresight and achievement are always limited. "Success and failure are fundamental categories."

The Work of Science. In science we study carefully the recurring sequences which nature presents: how stones fall, when water freezes and boils, how gases behave. Until recently, under the influence of Newtonian physics, the regularity of these sequences has unduly impressed the modern mind. It begins now to appear that we have in connection overlooked two things.

For one thing, these regularities are probably not as exact as once we thought; they seem rather to be statistical averages. For another, we formerly disregarded the "if" aspect of these sequences: *if* thus-and-such conditions prevail, *then* will such-and-such state of affairs follow. This "if" aspect may be, and often is, in our hands. If so, it is we who are to say whether the "thus-and-such" antecedent conditions are to prevail; and, under such conditions, it is we who thus bring about the "such-and-such" conclusions; or, as some would prefer, "nature" does it at our bidding. So conceived, these "laws of nature" present simply certain dependable expectations that we can within limits use to our ends. In this newer conception of science we thus get not a "reign of law" to

bind us, but wider tools for extending our control. Through these we gain freedom, not lose it.

Modern Change. This mingled dependability and uncertainty has always confronted man. Even in that old stone age, when (as we are told) man went thirty thousand years without making a significant invention, both elements were present: every hunt had its uncertain outcome—the stone axe would remain an axe and properly directed would do its dependable part, but aims might miss. In our day science grows greatly, many realms of uncertainty have been explored, more dependabilities are at our command, predictability has increased. But, at the same time, a growing science begets inventions, machines multiply, life becomes more complex, new and more intricate problems arise, new uncertainties confront us. So complex is the changing scene that in spite of science—nay, by reason of it—the future is uncertain probably in more different ways than ever before. Such is the general situation. This is the world that at bottom confronts us. From it education must take its departure.

The Nature of Behavior. As we look more closely at life itself, the newer biologic view of organism helps us to understand behavior possibly as never before. Any organism is seen as a self-regulative pattern, inextricably interwoven with the environment. When by a change either within or without the organism the equilibrium of the organism is upset, there ensues a strain which we variously call need, want, wish, drive, preference, or the like. Consequent upon this strain there ensue movements directed toward the environment which tend to restore the lost equilibrium. These movements will (typically) both continue and (if need be) vary until equilibrium is restored. Thus pepper in the nose brings an upset which in turn results in sneezing. "Nature's effort," we say, to remove the pepper. Or hunger (as an upset) brings "seeking" movements which typically find food to relieve the hunger. All such movements so arising we call behavior. It appears that all life activities are of this nature. The specific "drive" to them comes thus from the upset and continues (typically) till equilibrium is restored. This peculiar and characteristic connection here existing between the upset and the consequent varying behavior is highly significant. The upset furnishes the "efficient cause" to the behavior movements. The same upset—or if you prefer, its removal—supplies at the same time the final end of these move-

ments: the movements typically both continue and vary until the upset is removed. Such a state of affairs presents an essentially teleological character. Behavior is at bottom purposive.

The Place of Learning. From this discussion comes new light on what "learn" means. Where the organism faces a sufficiently novel situation, old responses will not suffice. A new response is called for or failure confronts. If fortunate, the organism will contrive a response new to it and adequate to cope with the novel difficulty. Such a contriving we call "learning." A dog is upset at being shut in an enclosure. He finds or contrives a way out. It works. Thereafter, if shut in, he uses his new-found exit (or, more exactly, his newly contrived response). He has "learned" how to meet the situation. Since he did not have this way of responding before, we may, if we wish, say that he has "created" a response novel to him. In such a case the restoration (return to equilibrium) is not to the prior state. The organism is different by the new response and all that it brings. Each act of learning adds a certain change and increment to the very structure of the organism itself. Learning thus involves two aspects: one creative, in which a new response is contrived; the other conserving, in which this newly contrived response is added to the very structure of the organism.

How Learning Builds Structure. To speak of addition to structure may sound strange, but the facts seem exactly this. In time past we have often thought of organic development as the attainment of prearranged adult structure, and of functioning as the working of the machine thus developed. This view no longer suffices. Rather is development the very behavior process above described, bringing in its train successive additions to structure, each contrived (within inherited limits) to care for a then pressing difficulty. On this view there is no one end-state of development fixed in advance, but a continuing process determined (within hereditary bounds, to be sure) by the adaptive process itself. Functioning is thus always present where life exists and is itself the means for that creation of new structure which we ordinarily call development. Structure-building in the human continues thus after the obvious-to-sight-and-touch structure has been attained.

Instances of such structure-building in the human are seen in habit, skill, knowledge, and the like. If we once come to see that structure (possibly like everything else) is the kind of thing that *is*

what it *does*, and so need not be visible to eye or present to touch, it may not seem strange to count habit and attitude as human structure along with ear or foot. Each—ear or foot or habit or attitude—abides more or less permanently as part of us. Each such part contributes to our responses, serving characteristically to guide and direct our conduct. Without any one of these we should be different and behave differently from what in fact is now true. In short, each is very structure.

Moreover, each—ear or foot as truly as habit or attitude—is an organismic achievement (so biology teaches us), brought into existence by the organism in its behavior efforts to meet its situations. "Development" and "learning" in this way form a continuous series. This postnatal structure building is most obviously of prime importance to the self and its building.[1] Before we leave this view of behavior several important corollaries should receive at least brief attention.

Principles of Learning. The learning process becomes clearer in this conception of behavior. A novel situation calls for a new response. The organism (in a case of learning) contrives a new response. If this reduces the disturbance, it is accepted for future use. Learning has so far taken place. The principle of "effect" is written thus in the very constitution of learning. And "satisfaction" (to use Thorndike's term) is explained. This comes not from some prior existing pleasure, but the reverse. Pleasure from eating, for example, depends (as everyone knows) upon satisfaction of appetite, and appetite here appears simply as organic urge or "upset" due to depletion of energy within the body. Satisfaction in essence is successful restoration, actual or promised.

We may restate the foregoing from a slightly different angle. That the organism should, under the conserving aspect of learning, incorporate into itself as abiding new structure the selected results of experience is perhaps as marvelous a fact as anything known to man. But we are not content to marvel; study should aim to find the conditions under which such incorporation (learning) takes place. The answer seems to be that what one thus learns (incorporates) in

[1] Reference to self calls for the more general assertion that the foregoing biologic view of behavior holds *mutatis mutandis* as truly of man as of the lower forms. Always the character of the organism (its "organismic pattern") is an essential ingredient to determine the character of the upsets and their incidence. Man's vastly more complex make-up means widely different upsets, but there seems no doubt that the discussion would be the same.

and from an experience depends on what one accepts from it. The fact of present organic acceptance as basis for further conduct seems to determine the fact of learning (organic incorporation). As we engage in conduct, we accept elements in the process variously as facts to act upon, as ends to work for, as plans to guide action, as attitudes to act on, as movements (skills) to work with. When we try these out, some we reject or modify, others we accept as now suitable for subsequent use. Whatever then stands the test of thought and trial so that we accept it for subsequent action, that we learn and it becomes a part of us. It must be insisted in connection that one learns only and exactly with and under the conditions and limitations that enter into the process of acceptance. To make acceptance fundamental in learning seems to force attention and emphasis where it belongs, namely, upon the organism acting as a whole. In the case of humans, conscious consideration has thus its proper opportunity of serving focally in the fact of learning.

Value. In this biological view of behavior, "value" also is shown in new light. Man learns that certain things promise help in dealing with certain recurring upsets. These helpful things are desired for what they promise. The things themselves we call "goods," their recognized promise (especially after criticism) we call "value."

The Whole Organism in Each Learning Act. Still further, it appears that in each instance of behavior as above described the whole organism, and in some measure each constituent part, is involved. If this be so (and it is increasingly accepted), learning then takes on a very broad meaning. It becomes not simply the acquisition of a new way of behaving as this has commonly been conceived. Rather does each new way of behavior mean in some degree a remaking of the whole organism. No part is omitted: intellectual insight (with more or less of "what," "why," and "how"), emotional changes (likes or dislikes toward the various elements noted in the experience), glandular readjustments, neuromuscular readjustments. Some remaking and reorganizing is effected throughout, the degree of change at any point depending on the character of the experience as a whole and on the connection of the particular point with the rest. The far-reaching significance of this conception no intelligent theory of education can disregard. The whole organism is in some degree changed in each learning experience.

Unity of Organism and Environment. Still further, not only is

the whole organism thus involved in each learning experience, the environment also is involved. Indeed, the relationship between organism and environment is uniquely close. According to Haldane[2] "an organism and its environment are one, just as the parts and activities of the organism are one, in the sense that though we can distinguish them we cannot separate them unaltered, and consequently cannot understand or investigate one apart from the rest." These are strong words, but they appear to represent the trend of competent thought. Learning, from this consideration, joins the organism—here the human self—with the environment in a new and intimate fashion. Any "organic" activity is as much an affair of the environment as it is of the organism. Any habit of a child belongs as truly to the situation as to the child, for it joins both together. And "the situation" is the actual total situation in all its particular manifestations to which the child is in fact sensitive. In a true sense any significant instance of learning thus joins up in a way new for the child indefinitely many parts of the situation at the same time that it remakes the child in indefinitely many aspects. Learning becomes thus immensely far-reaching and we see the more clearly how inadequate—nay, how hazardous—are those procedures and those studies which attempt to base themselves on single and isolated learnings. The whole child with all his effectual past now actually located in a present concrete situation with all its effectual connectednesses—this is the only unit. Anything less is an abstraction, a part only. Conclusions based on such abstractions need not elsewhere be valid, and treatment proposed under such conditions may well be harmful. Difficult as are the demands herein made, we dare not disregard them.

Each Person Socially Built. From this organism-environment unity comes the further consideration that each person is socially constructed. Learning, as we saw earlier, builds actual structure. Here we see that each one builds himself, must build himself, in relation to material supplied by the social environment. Each instance of learning is a response to the situation, is an effort to grapple with that situation. Since other persons are, as a rule, much the most significant environmental factors in experience, the child especially reacts to persons and builds himself accordingly. Each of us is thus in very truth composed in part of all that he has met. The growing child builds itself with reference to, and so of, mother,

[2] J. S. Haldane. *Organism and Environment*, p. 99. Yale University Press, 1917.

nurse, older brother, father, all—each in the degree and kind that it has been accepted as an actual factor in the social situation. And each of these other persons affects the child in and amid a general social situation and through a slowly changing body of group-built forms, ways, customs, contents, etc., which we call the culture or the social inheritance. The socially conditioning factors which the child meets we cannot too much stress.

And in immediate connection it is sad to note that maladjustment in the child only too often comes from a maladjusted parent. Discipline problems are generally home problems.

Interactive Adaptation. As we think thus of organism and environment, of the self and the environing and institutional life, the problem of their interaction arises. Many see here only an interaction in which one factor must yield entirely to the other. Our historic past held, in effect if not in words, that the individual, particularly the child, must be adapted exactly to the institutional life about it. Education has traditionally been so conceived. As opposed to this view, a few extreme protestants on the other side have, again in effect if not in words, given the individual *carte blanche*. Institutions must yield. But our discussion leads rather to another position. Institutions are the ways in which we jointly conduct our shared interests. As such, like all other behavior patterns, they are to be held plastic to thought. They are to be modified continually as new situations demand or better insight shall be achieved. The criterion will be the intelligently criticized result of the trial itself after this has been broadly considered, intelligently conceived, and honestly done. This means the progressive improvement of both self and institutions, neither being sacrificed to the other. Education thus becomes the process whereby the individual shares more intelligently in the active direction of life about him and accordingly grows in appreciation of existing patterns and in the practice of judging them. Continual interactive adaptation is thus consciously to be sought.

Conscious Action. One particular way of responding greatly concerns us, that in which we meet a novelly developing situation. By contrast we may consider a recurring element of life and the reflex or the (mere) habit as responses already made in advance to take care of such an element when it comes. On this basis, when the appropriate stimulus comes, the response follows "automatically," or "mechanically," we often say. "Unconsciously" or

"unintentionally" may be other ways of describing the same thing. This "mechanistic" response to a recurring element in the experience taken as the sole unit of description and explanation seems the inadequate basis of much recently current psychology.

But there is another kind of situation. I approach a busy street with neither traffic light nor policeman to help me. I study the situation, note the cars moving in one direction and the other, and finally contrive in terms of the shifting elements a way of proceeding. This way of proceeding is no response made in advance. It could not have been made in advance. I made my plan of action as the situation itself unfolded. I could do nothing else under such circumstances. I act not "automatically" but "consciously." I "intend" each move as I make it. If I do not "know" what I am about, do not properly "size up" the developing situation, or do not "act accordingly," I shall likely meet disaster. Note then here

a. A novelly developing situation—I do not know until I see it developing just what it will be—and

b. The contriving of a plan of action made up in part of old ways of behaving but still as a whole specifically and continually devised to meet this identic situation.

This kind of action is clearly the correlative of the kind of changing world discussed at the outset. A novelly developing world requires consciously devised procedures, devised in terms of the novel elements and as these present themselves. But the recurrent elements are equally present to tell me, as best I can make it out, what is to be expected from the situation and how to deal with it. Conscious action adapts the old to the novelly developing situation. Since each such situation is in some measure unique, each such conscious solution is in like degree unique. This kind of responding we may call a "creative" act.

How Meanings Serve. The part played by meanings in this situation demands closer study. As soon as I come to the street I see and "recognize" automobiles as such, see some as approaching and others as receding. I "sense" how fast they are coming in terms of what I can or cannot do in the way of avoiding them, "sense" the width of the street, etc., etc. Now the signs which the eye gets from those various aspects of the situation, such that "recognizing" and "sensing" and "planning my steps" go on appropriately—these signs thus laden with significance we call meanings. Meanings then are a convenient term for the smaller elements that we put

together when we "size up" a situation, or "recognize" a thing (in the fuller sense), or make an appropriate plan of action for dealing with a situation. Meanings clearly are learned, the results of past experience. Moreover, at any one time one's meanings may be valid or not; they can be well organized or not. In short, the meaning is the unit element of mind, as mind is the name we give to the way in which any one grapples with the stream of novelly developing situations. Education is clearly much concerned with getting many and good meanings and in organizing them for best use.

The Self. The term "self" is a very convenient one with which to treat certain manifestations of behavior. To conceive this more clearly, it may help us to think of the human organism and its equilibrative behavior as earlier discussed, particularly as it acts through meanings. To this we add the conception that learning builds organic structure, here especially the structure of meanings and habits. We must consider also the part that language plays in giving, as it were, "body" to memories and to meanings, thus allowing the growing child to contrast and interrelate experiences, both his own and others', in such a way in particular as to grasp somewhat of the relation we call "cause and effect" and to see (in a measure) how the "present" is related to a "past" and in turn to a "future." At length, putting these and their like together, the child forms that unity within his thinking life which he calls at first by his own name and later by the pronouns mine, me, I (in contrast with your, you, his, him, he). Thus is the self conceived. As we see here and saw above, the social element in the self is inherent and inextricable.

Self-direction. An essential function of the self is choosing. We can do this properly only as we contrast the consequences reasonably to be expected from the alternative courses respectively open to us. Only through the use of past organized meanings can we foretell and contrast such consequences. As new meanings arise or fresh relations are seen (themselves new meanings), choices will (likely) change. We can learn thus to search for new and better meanings, and meanwhile to hold overt action in suspense in order to get a better decision. The effort made in this way to base conduct increasingly on more adequate meanings thus consciously sought, does in fact free one more and more from the binding effect of mere past action, and from the mere "cause and effect" environ-

ment as such. To act thus more in the light of foresought, foreseen, and foreweighed consequences is to increase what we may properly call "self-direction." This is by that much to free one from the mere accident of environment and from the mere whim of immediate impulse. Such self-direction is living in accord with the larger view. Meanings thus sought and thus used "free" us, for through them we live more intelligently.

Up-building the Self. To up-build the self is then to improve one's working stock of meanings, making them ever more numerous, ever more inclusive of the rich potentialities of life, ever better validated, better and better refined and defined, ever better organized—and finally ever better and better obeyed as these better meanings are efficiently worked up into appropriate plans of action.

The Divided Self. We discussed above how the organism responds as a whole. In spite of this fact we find disorganized selves. The apparent contradiction requires consideration. Behavior, as we saw, springs from some upset of equilibrium. If a succession of upsets arises consistently from one source, the self will likely build an organized aggregate of responses to fit this stimulating source. Such an aggregate will consist of habits of expectation, of likes and dislikes, of internal secretion adjustments, of neuromuscular adjustments, etc., etc. Since the organism acts as a whole, this recurring source of upset has in some measure rebuilt the whole self around this source as a center. Such a rebuilding about one center we often call "an interest." An interest will be healthy and desirable in the degree that action in accord with it can and will stand the test of open and shared criticism of consequences. Otherwise we call such a center a "complex," a tendency of conduct that has not been integrated for ready obedience to meanings approved after shared consideration. An active, healthy, properly approved interest will usually be a clear addition to life.

But it may happen that two sources of upset, more or less simultaneous, may act incompatibly. They make opposed and inconsistent demands. The person is pulled in opposed directions. If one so assailed is able in fact to solve the problem thus set, well and good. His "solution"—if real—integrates the hitherto opposed demands into one consistent line of action. Such a solution "integrates the personality" concerned. The threatened split and opposition has been healed. But it often happens that no such satisfactory solution seems feasible. If so, a working compromise

may instead be effected. One set of demands may be given "outward" sway before coercing eyes, while the other is preferred "inwardly." If these upsets recur and continue consistently to oppose each other, this condition of division between "outer" and "inner" may become chronic. Two partial centers of reference have been set up within the personality, to divide sway, so to speak, over that personality. A "divided self" is the result. Neither center can function efficiently because of the other. Life is less happy. The results generally are bad.

Integration of the Self. The foregoing is so important that it may be worth while to repeat the discussion from a slightly different angle. Each response to a situation involves the whole organism. In some measure, each actual response remakes the organism throughout. Now it often happens that some confronting situation, being complex, will make contradictory demands. I am a child. My father wishes me to run an errand, but we boys had arranged to play ball. A problem confronts me. I may "solve" it by contriving to do both. Suppose, however, this cannot be done and my father "makes" me give up the ball game for the errand. The consequent effect on me will depend on how I do in fact respond to this new development of the situation, on how I "integrate" the total experience. If I think it through and do honestly see that after all my father is "right" and I do in fact "accept" the situation accordingly, then the effect is healthy. I have, so to say, morally digested the experience. I now see in one ordered whole outlook those certain elements in life that before were disordered and contradictory. I have in so far integrated my personality.

But if I feel the demand as unjust and yield only through fear, and this coercion "rankles," then the experience has not been morally digested. The further effects may be very unhappy. The "rankle" means that the upset still continues. A repetition will likely add to the "soreness." I begin to "nurse" a grievance, to "harbor" feelings of opposition. Maladjustment to the situation (in which my father is a factor) is the result. Disintegration rather than integration has been brought about. As long as this state continues, my responses in this field are warped. I am not happy. I am ill adjusted.

The Older Ideal. These two ways of responding do not of course exhaust the possibilities of the situation. Rather are they contrasted extremes. A third possibility will arise to many. I may,

though a child, have such confidence in my father and love for him —especially if on these foundations I have previously built habits of ready obedience to his wishes—that under such circumstances I may cheerfully forego the lost ball game and hurry along on my errand thinking mainly of other things. I don't understand all that my father has in mind, but I accept his decision and cheerfully act accordingly. As regards this instance I have as a child integrated my personality on this type of child-father relationship. In an earlier day such a solution was the dominant ideal. There is no doubt that it often "worked" and that in its way it may at times still be made "to work." Its limitations may better appear after a further consideration has been introduced. In a word, the situation at large must be considered and the correlative "integration" of the individual with that must be adequately effected.

Integration with Life about Us. Personal and internal integration as above discussed was based largely on such personal "acceptance" of one line of conduct as would thereby remove or otherwise settle internal opposition. As a sole criterion this is liable to bring harmful results. Are there not some demands which a person should reject? Is the line of least resistance always the proper one? The proper consideration seems to be this: In the degree that my acceptance is based upon such an understanding and consideration of all the bearings of my decision on others concerned that I can use it as a means of more intelligent dealing with similar situations hereafter, in like degree has my thinking and my acceptance been good and my consequent integration proper and defensible. Under such circumstances I am not only integrated within but I have also effected a defensible integration between myself and the probable demands of the larger life about me. In other words, however desirable personal integration may be—and it is hard to think of any one thing more essential—any instance of personal integration to be fully defended must at the same time make also for social integration, for more adequate self-direction in the light of the new and possibly contradictory demands of life. Personal integration can last only as it is based on continual growth into ever more adequate appreciation of our relationships with the life of others about us. No personal life can be satisfactory that does not base itself on a due consideration of the social effects of conduct.

Means of Integration. Personal integration admits of many degrees, not only as to how well integration has in fact been effected,

but also as to what degree of complexity and refinement enters into the construction of the self. The latter aspect we often speak of as "personality" or "individuality"—"personality" when we think of how persons affect each other as they meet, "individuality" when we think of how persons may differ in richness and refinement and actual efficiency of internal organization. Some things may be said as to how best to effect such desirable results. Degree of internal organization must of course follow principles of learning. The more one is (healthily) stirred, the more of actual response is effected. Purposeful activity brings thorough integration in two ways, the self is more actually enlisted and the response is more unified. There is more learning effect and the whole self is (along this line of response) knit better together.

"Thinking through" and "understanding" help similarly to integrate. Both "thinking through" and "understanding" relate many meanings in new ways and at the same time bring the whole to a better unity of organization. Of exactly contrary effects are the learning of isolated items and the failure to understand and appreciate. What learning takes place under such circumstances seems certainly to fail of best integration, if it does not make positively for disintegration. Learning activities should desirably grow, therefore, as richly and honestly as possible from the children's past so as to provide rich connections of learning. Just as the self is built of what is learned, so each self is related through its learning to the life about. The two are but inner and outer aspects of the same process, but both need to be kept in mind: the self, that it may grow richly and in integrated fashion; what is learned, that it may more and more adequately include all aspects of life and more and more adequately provide for its efficient management.

The word efficient is so often used of narrow aims that attention may properly be called to its wider use here. The efficient management of life is here conceived to include on the one hand the varied richnesses which life can give and on the other hand such a unified treatment of these that the resulting life is good as a whole. Any lesser conception of efficiency is inadequate. Moreover, only as our children live such a life in contact with those more advanced in it may we hope to have them grow in personality or individuality.

Facing Reality. As the correlative of some things said above there is perhaps no surer road to the disintegration of personality