

Experience and Thinking

1. The Nature of Experience

The nature of experience can be understood only by noting that it includes an active and a passive element peculiarly combined. On the active hand, experience is trying - a meaning which is made explicit in the connected term experiment. On the passive, it is undergoing. When we experience something we act upon it, we do something with it; then we suffer or undergo the consequences. We do something to the thing and then it does something to us in return: such is the peculiar combination. The connection of these two phases of experience measures the fruitfulness or value of the experience. Mere activity does not constitute experience. It is dispersive, centrifugal, dissipating. Experience as trying involves change, but change is meaningless transition unless it is consciously connected with the return wave of consequences which flow from it. When an activity is continued into the undergoing of consequences, when the change made by action is reflected back into a change made in us, the mere flux is loaded with significance. We learn something. It is not experience when a child merely sticks his finger into a flame; it is experience when the movement is connected with the pain which he undergoes in consequence. Henceforth the sticking of the finger into flame means a burn. Being burned is a mere physical change, like the burning of a stick of wood, if it is not perceived as a consequence of some other action. Blind and capricious impulses hurry us on heedlessly from one thing to another. So far as this happens, everything is writ in water. There is none of that cumulative growth which makes an experience in any vital sense of that term. On the other hand, many things happen to us in the way of pleasure and pain which we do not connect with any prior activity of our own. They are

mere accidents so far as we are concerned. There is no before or after to such experience; no retrospect nor outlook, and consequently no meaning. We get nothing which may be carried over to foresee what is likely to happen next, and no gain in ability to adjust ourselves to what is coming - no added control. Only by courtesy can such an experience be called experience. To "learn from experience" is to make a backward and forward connection between what we do to things and what we enjoy or suffer from things in consequence. Under such conditions, doing becomes a trying; an experiment with the world to find out what it is like; the undergoing becomes instruction - discovery of the connection of things.

Two conclusions important for education follow. (1) Experience is primarily an active-passive affair; it is not primarily cognitive. But (2) the measure of the value of an experience lies in the perception of relationships or continuities to which it leads up. It includes cognition in the degree in which it is cumulative or amounts to something, or has meaning. In schools, those under instruction are too customarily looked upon as acquiring knowledge as theoretical spectators, minds which appropriate knowledge by direct energy of intellect. The very word pupil has almost come to mean one who is engaged not in having fruitful experiences but in absorbing knowledge directly. Something which is called mind or consciousness is severed from the physical organs of activity. The former is then thought to be purely intellectual and cognitive; the latter to be an irrelevant and intruding physical factor. The intimate union of activity and undergoing its consequences which leads to recognition of meaning is broken; instead we have two fragments: mere bodily action on one side, and meaning directly grasped by "spiritual" activity on the other.

It would be impossible to state adequately the evil results which have flowed from this dualism of mind and body, much less to exaggerate them. Some of the more striking effects, may, however, be enumerated. (a) In part bodily activity becomes an intruder. Having nothing, so it is thought, to do with mental activity, it becomes a

distraction, an evil to be contended with. For the pupil has a body, and brings it to school along with his mind. And the body is, of necessity, a wellspring of energy; it has to do something. But its activities, not being utilized in occupation with things which yield significant results, have to be frowned upon. They lead the pupil away from the lesson with which his "mind" ought to be occupied; they are sources of mischief. The chief source of the "problem of discipline" in schools is that the teacher has often to spend the larger part of the time in suppressing the bodily activities which take the mind away from its material. A premium is put on physical quietude; on silence, on rigid uniformity of posture and movement; upon a machine-like simulation of the attitudes of intelligent interest. The teachers' business is to hold the pupils up to these requirements and to punish the inevitable deviations which occur.

The nervous strain and fatigue which result with both teacher and pupil are a necessary consequence of the abnormality of the situation in which bodily activity is divorced from the perception of meaning. Callous indifference and explosions from strain alternate. The neglected body, having no organized fruitful channels of activity, breaks forth, without knowing why or how, into meaningless boisterousness, or settles into equally meaningless fooling - both very different from the normal play of children. Physically active children become restless and unruly; the more quiescent, so-called conscientious ones spend what energy they have in the negative task of keeping their instincts and active tendencies suppressed, instead of in a positive one of constructive planning and execution; they are thus educated not into responsibility for the significant and graceful use of bodily powers, but into an enforced duty not to give them free play. It may be seriously asserted that a chief cause for the remarkable achievements of Greek education was that it was never misled by false notions into an attempted separation of mind and body.

(b) Even, however, with respect to the lessons which have to be learned by the application of "mind," some bodily activities have to be

used. The senses - especially the eye and ear - have to be employed to take in what the book, the map, the blackboard, and the teacher say. The lips and vocal organs, and the hands, have to be used to reproduce in speech and writing what has been stowed away. The senses are then regarded as a kind of mysterious conduit through which information is conducted from the external world into the mind; they are spoken of as gateways and avenues of knowledge. To keep the eyes on the book and the ears open to the teacher's words is a mysterious source of intellectual grace. Moreover, reading, writing, and figuring - important school arts - demand muscular or motor training. The muscles of eye, hand, and vocal organs accordingly have to be trained to act as pipes for carrying knowledge back out of the mind into external action. For it happens that using the muscles repeatedly in the same way fixes in them an automatic tendency to repeat.

The obvious result is a mechanical use of the bodily activities which (in spite of the generally obtrusive and interfering character of the body in mental action) have to be employed more or less. For the senses and muscles are used not as organic participants in having an instructive experience, but as external inlets and outlets of mind. Before the child goes to school, he learns with his hand, eye, and ear, because they are organs of the process of doing something from which meaning results. The boy flying a kite has to keep his eye on the kite, and has to note the various pressures of the string on his hand. His senses are avenues of knowledge not because external facts are somehow "conveyed" to the brain, but because they are used in doing something with a purpose. The qualities of seen and touched things have a bearing on what is done, and are alertly perceived; they have a meaning. But when pupils are expected to use their eyes to note the form of words, irrespective of their meaning, in order to reproduce them in spelling or reading, the resulting training is simply of isolated sense organs and muscles. It is such isolation of an act from a purpose which makes it mechanical. It is customary for teachers to urge children to read with expression, so as to bring out

the meaning. But if they originally learned the sensory-motor technique of reading - the ability to identify forms and to reproduce the sounds they stand for - by methods which did not call for attention to meaning, a mechanical habit was established which makes it difficult to read subsequently with intelligence. The vocal organs have been trained to go their own way automatically in isolation; and meaning cannot be tied on at will. Drawing, singing, and writing may be taught in the same mechanical way; for, we repeat, any way is mechanical which narrows down the bodily activity so that a separation of body from mind - that is, from recognition of meaning - is set up. Mathematics, even in its higher branches, when undue emphasis is put upon the technique of calculation, and science, when laboratory exercises are given for their own sake, suffer from the same evil.

(c) On the intellectual side, the separation of "mind" from direct occupation with things throws emphasis on things at the expense of relations or connections. It is altogether too common to separate perceptions and even ideas from judgments. The latter are thought to come after the former in order to compare them. It is alleged that the mind perceives things apart from relations; that it forms ideas of them in isolation from their connections - with what goes before and comes after. Then judgment or thought is called upon to combine the separated items of "knowledge" so that their resemblance or causal connection shall be brought out. As matter of fact, every perception and every idea is a sense of the bearings, use, and cause, of a thing. We do not really know a chair or have an idea of it by inventorying and enumerating its various isolated qualities, but only by bringing these qualities into connection with something else - the purpose which makes it a chair and not a table; or its difference from the kind of chair we are accustomed to, or the "period" which it represents, and so on. A wagon is not perceived when all its parts are summed up; it is the characteristic connection of the parts which makes it a wagon. And these connections are not those of mere physical juxtaposition; they involve connection with the animals that draw it,

the things that are carried on it, and so on. Judgment is employed in the perception; otherwise the perception is mere sensory excitation or else a recognition of the result of a prior judgment, as in the case of familiar objects.

Words, the counters for ideals, are, however, easily taken for ideas. And in just the degree in which mental activity is separated from active concern with the world, from doing something and connecting the doing with what is undergone, words, symbols, come to take the place of ideas. The substitution is the more subtle because some meaning is recognized. But we are very easily trained to be content with a minimum of meaning, and to fail to note how restricted is our perception of the relations which confer significance. We get so thoroughly used to a kind of pseudo-idea, a half perception, that we are not aware how half-dead our mental action is, and how much keener and more extensive our observations and ideas would be if we formed them under conditions of a vital experience which required us to use judgment: to hunt for the connections of the thing dealt with. There is no difference of opinion as to the theory of the matter. All authorities agree that that discernment of relationships is the genuinely intellectual matter; hence, the educative matter. The failure arises in supposing that relationships can become perceptible without experience - without that conjoint trying and undergoing of which we have spoken. It is assumed that "mind" can grasp them if it will only give attention, and that this attention may be given at will irrespective of the situation. Hence the deluge of half-observations, of verbal ideas, and unassimilated "knowledge" which afflicts the world. An ounce of experience is better than a ton of theory simply because it is only in experience that any theory has vital and verifiable significance. An experience, a very humble experience, is capable of generating and carrying any amount of theory (or intellectual content), but a theory apart from an experience cannot be definitely grasped even as theory. It tends to become a mere verbal formula, a set of catchwords used to render thinking, or genuine theorizing, unnecessary and impossible. Because of our education we use words, thinking they are

ideas, to dispose of questions, the disposal being in reality simply such an obscuring of perception as prevents us from seeing any longer the difficulty.

2. Reflection in Experience

Thought or reflection, as we have already seen virtually if not explicitly, is the discernment of the relation between what we try to do and what happens in consequence. No experience having a meaning is possible without some element of thought. But we may contrast two types of experience according to the proportion of reflection found in them. All our experiences have a phase of "cut and try" in them - what psychologists call the method of trial and error. We simply do something, and when it fails, we do something else, and keep on trying till we hit upon something which works, and then we adopt that method as a rule of thumb measure in subsequent procedure. Some experiences have very little else in them than this hit and miss or succeed process. We see that a certain way of acting and a certain consequence are connected, but we do not see how they are. We do not see the details of the connection; the links are missing. Our discernment is very gross. In other cases we push our observation farther. We analyze to see just what lies between so as to bind together cause and effect, activity and consequence. This extension of our insight makes foresight more accurate and comprehensive. The action which rests simply upon the trial and error method is at the mercy of circumstances; they may change so that the act performed does not operate in the way it was expected to. But if we know in detail upon what the result depends, we can look to see whether the required conditions are there. The method extends our practical control. For if some of the conditions are missing, we may, if we know what the needed antecedents for an effect are, set to work to supply them; or, if they are such as to produce undesirable effects as well, we may eliminate some of the superfluous causes and economize effort.

In discovery of the detailed connections of our activities and what happens in consequence, the thought implied in cut and try experience is made explicit. Its quantity increases so that its proportionate value is very different. Hence the quality of the experience changes; the change is so significant that we may call this type of experience reflective - that is, reflective par excellence. The deliberate cultivation of this phase of thought constitutes thinking as a distinctive experience. Thinking, in other words, is the intentional endeavor to discover specific connections between something which we do and the consequences which result, so that the two become continuous. Their isolation, and consequently their purely arbitrary going together, is canceled; a unified developing situation takes its place. The occurrence is now understood; it is explained; it is reasonable, as we say, that the thing should happen as it does.

Thinking is thus equivalent to an explicit rendering of the intelligent element in our experience. It makes it possible to act with an end in view. It is the condition of our having aims. As soon as an infant begins to expect he begins to use something which is now going on as a sign of something to follow; he is, in however simple a fashion, judging. For he takes one thing as evidence of something else, and so recognizes a relationship. Any future development, however elaborate it may be, is only an extending and a refining of this simple act of inference. All that the wisest man can do is to observe what is going on more widely and more minutely and then select more carefully from what is noted just those factors which point to something to happen. The opposites, once more, to thoughtful action are routine and capricious behavior. The former accepts what has been customary as a full measure of possibility and omits to take into account the connections of the particular things done. The latter makes the momentary act a measure of value, and ignores the connections of our personal action with the energies of the environment. It says, virtually, "things are to be just as I happen to like them at this instant," as routine says in effect "let things continue just as I have found them in the past." Both refuse to acknowledge responsibility for

the future consequences which flow from present action. Reflection is the acceptance of such responsibility.

The starting point of any process of thinking is something going on, something which just as it stands is incomplete or unfulfilled. Its point, its meaning lies literally in what it is going to be, in how it is going to turn out. As this is written, the world is filled with the clang of contending armies. For an active participant in the war, it is clear that the momentous thing is the issue, the future consequences, of this and that happening. He is identified, for the time at least, with the issue; his fate hangs upon the course things are taking. But even for an onlooker in a neutral country, the significance of every move made, of every advance here and retreat there, lies in what it portends. To think upon the news as it comes to us is to attempt to see what is indicated as probable or possible regarding an outcome. To fill our heads, like a scrapbook, with this and that item as a finished and done-for thing, is not to think. It is to turn ourselves into a piece of registering apparatus. To consider the bearing of the occurrence upon what may be, but is not yet, is to think. Nor will the reflective experience be different in kind if we substitute distance in time for separation in space. Imagine the war done with, and a future historian giving an account of it. The episode is, by assumption, past. But he cannot give a thoughtful account of the war save as he preserves the time sequence; the meaning of each occurrence, as he deals with it, lies in what was future for it, though not for the historian. To take it by itself as a complete existence is to take it unreflectively. Reflection also implies concern with the issue - a certain sympathetic identification of our own destiny, if only dramatic, with the outcome of the course of events. For the general in the war, or a common soldier, or a citizen of one of the contending nations, the stimulus to thinking is direct and urgent. For neutrals, it is indirect and dependent upon imagination. But the flagrant partisanship of human nature is evidence of the intensity of the tendency to identify ourselves with one possible course of events, and to reject the other as foreign. If we cannot take sides in overt action, and throw in our little weight to help

determine the final balance, we take sides emotionally and imaginatively. We desire this or that outcome. One wholly indifferent to the outcome does not follow or think about what is happening at all. From this dependence of the act of thinking upon a sense of sharing in the consequences of what goes on, flows one of the chief paradoxes of thought. Born in partiality, in order to accomplish its tasks it must achieve a certain detached impartiality. The general who allows his hopes and desires to affect his observations and interpretations of the existing situation will surely make a mistake in calculation. While hopes and fears may be the chief motive for a thoughtful following of the war on the part of an onlooker in a neutral country, he too will think ineffectively in the degree in which his preferences modify the stuff of his observations and reasonings. There is, however, no incompatibility between the fact that the occasion of reflection lies in a personal sharing in what is going on and the fact that the value of the reflection lies upon keeping one's self out of the data. The almost insurmountable difficulty of achieving this detachment is evidence that thinking originates in situations where the course of thinking is an actual part of the course of events and is designed to influence the result. Only gradually and with a widening of the area of vision through a growth of social sympathies does thinking develop to include what lies beyond our direct interests: a fact of great significance for education.

To say that thinking occurs with reference to situations which are still going on, and incomplete, is to say that thinking occurs when things are uncertain or doubtful or problematic. Only what is finished, completed, is wholly assured. Where there is reflection there is suspense. The object of thinking is to help reach a conclusion, to project a possible termination on the basis of what is already given. Certain other facts about thinking accompany this feature. Since the situation in which thinking occurs is a doubtful one, thinking is a process of inquiry, of looking into things, of investigating. Acquiring is always secondary, and instrumental to the act of inquiring. It is seeking, a quest, for something that is not at hand. We sometimes talk

as if "original research" were a peculiar prerogative of scientists or at least of advanced students. But all thinking is research, and all research is native, original, with him who carries it on, even if everybody else in the world already is sure of what he is still looking for.

It also follows that all thinking involves a risk. Certainty cannot be guaranteed in advance. The invasion of the unknown is of the nature of an adventure; we cannot be sure in advance. The conclusions of thinking, till confirmed by the event, are, accordingly, more or less tentative or hypothetical. Their dogmatic assertion as final is unwarranted, short of the issue, in fact. The Greeks acutely raised the question: How can we learn? For either we know already what we are after, or else we do not know. In neither case is learning possible; on the first alternative because we know already; on the second, because we do not know what to look for, nor if, by chance, we find it can we tell that it is what we were after. The dilemma makes no provision for coming to know, for learning; it assumes either complete knowledge or complete ignorance. Nevertheless the twilight zone of inquiry, of thinking, exists. The possibility of hypothetical conclusions, of tentative results, is the fact which the Greek dilemma overlooked. The perplexities of the situation suggest certain ways out. We try these ways, and either push our way out, in which case we know we have found what we were looking for, or the situation gets darker and more confused - in which case, we know we are still ignorant. Tentative means trying out, feeling one's way along provisionally. Taken by itself, the Greek argument is a nice piece of formal logic. But it is also true that as long as men kept a sharp disjunction between knowledge and ignorance, science made only slow and accidental advance. Systematic advance in invention and discovery began when men recognized that they could utilize doubt for purposes of inquiry by forming conjectures to guide action in tentative explorations, whose development would confirm, refute, or modify the guiding conjecture. While the Greeks made knowledge more than learning, modern science makes conserved knowledge only a means to learning, to

discovery. To recur to our illustration. A commanding general cannot base his actions upon either absolute certainty or absolute ignorance. He has a certain amount of information at hand which is, we will assume, reasonably trustworthy. He then infers certain prospective movements, thus assigning meaning to the bare facts of the given situation. His inference is more or less dubious and hypothetical. But he acts upon it. He develops a plan of procedure, a method of dealing with the situation. The consequences which directly follow from his acting this way rather than that test and reveal the worth of his reflections. What he already knows functions and has value in what he learns. But will this account apply in the case of the one in a neutral country who is thoughtfully following as best he can the progress of events? In form, yes, though not of course in content. It is self-evident that his guesses about the future indicated by present facts, guesses by which he attempts to supply meaning to a multitude of disconnected data, cannot be the basis of a method which shall take effect in the campaign. That is not his problem. But in the degree in which he is actively thinking, and not merely passively following the course of events, his tentative inferences will take effect in a method of procedure appropriate to his situation. He will anticipate certain future moves, and will be on the alert to see whether they happen or not. In the degree in which he is intellectually concerned, or thoughtful, he will be actively on the lookout; he will take steps which although they do not affect the campaign, modify in some degree his subsequent actions. Otherwise his later "I told you so" has no intellectual quality at all; it does not mark any testing or verification of prior thinking, but only a coincidence that yields emotional satisfaction - and includes a large factor of self-deception. The case is comparable to that of an astronomer who from given data has been led to foresee (infer) a future eclipse. No matter how great the mathematical probability, the inference is hypothetical - a matter of probability. 1 The hypothesis as to the date and position of the anticipated eclipse becomes the material of forming a method of future conduct. Apparatus is arranged; possibly an expedition is made to some far part of the globe. In any case, some active steps are taken

which actually change some physical conditions. And apart from such steps and the consequent modification of the situation, there is no completion of the act of thinking. It remains suspended. Knowledge, already attained knowledge, controls thinking and makes it fruitful.

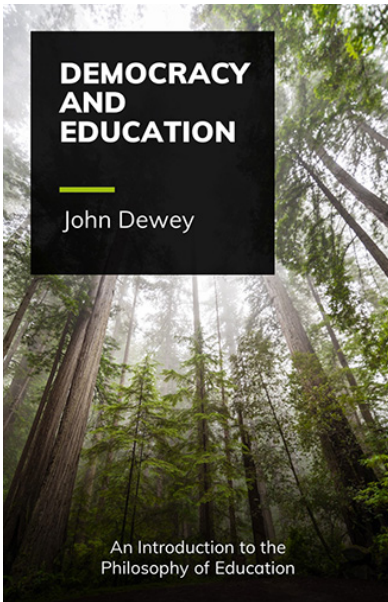
So much for the general features of a reflective experience. They are (i) perplexity, confusion, doubt, due to the fact that one is implicated in an incomplete situation whose full character is not yet determined; (ii) a conjectural anticipation - a tentative interpretation of the given elements, attributing to them a tendency to effect certain consequences; (iii) a careful survey (examination, inspection, exploration, analysis) of all attainable consideration which will define and clarify the problem in hand; (iv) a consequent elaboration of the tentative hypothesis to make it more precise and more consistent, because squaring with a wider range of facts; (v) taking one stand upon the projected hypothesis as a plan of action which is applied to the existing state of affairs: doing something overtly to bring about the anticipated result, and thereby testing the hypothesis. It is the extent and accuracy of steps three and four which mark off a distinctive reflective experience from one on the trial and error plane. They make thinking itself into an experience. Nevertheless, we never get wholly beyond the trial and error situation. Our most elaborate and rationally consistent thought has to be tried in the world and thereby tried out. And since it can never take into account all the connections, it can never cover with perfect accuracy all the consequences. Yet a thoughtful survey of conditions is so careful, and the guessing at results so controlled, that we have a right to mark off the reflective experience from the grosser trial and error forms of action.

Summary

In determining the place of thinking in experience we first noted that experience involves a connection of doing or trying with something

which is undergone in consequence. A separation of the active doing phase from the passive undergoing phase destroys the vital meaning of an experience. Thinking is the accurate and deliberate instituting of connections between what is done and its consequences. It notes not only that they are connected, but the details of the connection. It makes connecting links explicit in the form of relationships. The stimulus to thinking is found when we wish to determine the significance of some act, performed or to be performed. Then we anticipate consequences. This implies that the situation as it stands is, either in fact or to us, incomplete and hence indeterminate. The projection of consequences means a proposed or tentative solution. To perfect this hypothesis, existing conditions have to be carefully scrutinized and the implications of the hypothesis developed - an operation called reasoning. Then the suggested solution - the idea or theory - has to be tested by acting upon it. If it brings about certain consequences, certain determinate changes, in the world, it is accepted as valid. Otherwise it is modified, and another trial made. Thinking includes all of these steps, - the sense of a problem, the observation of conditions, the formation and rational elaboration of a suggested conclusion, and the active experimental testing. While all thinking results in knowledge, ultimately the value of knowledge is subordinate to its use in thinking. For we live not in a settled and finished world, but in one which is going on, and where our main task is prospective, and where retrospect - and all knowledge as distinct from thought is retrospect - is of value in the solidity, security, and fertility it affords our dealings with the future.

1 It is most important for the practice of science that men in many cases can calculate the degree of probability and the amount of probable error involved, but that does alter the features of the situation as described. It refines them.



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