

Theories of Knowledge

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1. Continuity versus Dualism. A number of theories of knowing have been criticized in the previous pages. In spite of their differences from one another, they all agree in one fundamental respect which contrasts with the theory which has been positively advanced. The latter assumes continuity; the former state or imply certain basic divisions, separations, or antitheses, technically called dualisms. The origin of these divisions we have found in the hard and fast walls which mark off social groups and classes within a group: like those between rich and poor, men and women, noble and baseborn, ruler and ruled. These barriers mean absence of fluent and free intercourse. This absence is equivalent to the setting up of different types of life-experience, each with isolated subject matter, aim, and standard of values. Every such social condition must be formulated in a dualistic philosophy, if philosophy is to be a sincere account of experience. When it gets beyond dualism -- as many philosophies do in form -- it can only be by appeal to something higher than anything found in experience, by a flight to some transcendental realm. And in denying duality in name such theories restore it in fact, for they end in a division between things of this world as mere appearances and an inaccessible essence of reality.

So far as these divisions persist and others are added to them, each leaves its mark upon the educational system, until the scheme of education, taken as a whole, is a deposit of various purposes and procedures. The outcome is that kind of check and balance of segregated factors and values which has been described. (See Chapter XVIII.) The present discussion is simply a formulation, in the terminology of philosophy, of various antithetical conceptions involved in the theory of knowing. In the first place, there is the opposition of empirical and higher rational knowing. The first is connected with everyday affairs, serves the purposes of the ordinary individual who has no specialized intellectual pursuit, and brings his wants into some kind of working connection with the immediate environment. Such knowing is depreciated, if not despised, as purely utilitarian, lacking in cultural significance. Rational knowledge is supposed to be something which touches reality in ultimate, intellectual fashion; to be pursued for its own sake and properly to terminate in purely theoretical insight, not debased by application in behavior. Socially, the distinction corresponds to that of the intelligence used by the working classes and

that used by a learned class remote from concern with the means of living. Philosophically, the difference turns about the distinction of the particular and universal. Experience is an aggregate of more or less isolated particulars, acquaintance with each of which must be separately made. Reason deals with universals, with general principles, with laws, which lie above the welter of concrete details. In the educational precipitate, the pupil is supposed to have to learn, on one hand, a lot of items of specific information, each standing by itself, and upon the other hand, to become familiar with a certain number of laws and general relationships. Geography, as often taught, illustrates the former; mathematics, beyond the rudiments of figuring, the latter. For all practical purposes, they represent two independent worlds.

Another antithesis is suggested by the two senses of the word "learning." On the one hand, learning is the sum total of what is known, as that is handed down by books and learned men. It is something external, an accumulation of cognitions as one might store material commodities in a warehouse. Truth exists ready-made somewhere. Study is then the process by which an individual draws on what is in storage. On the other hand, learning means something which the individual does when he studies. It is an active, personally conducted affair. The dualism here is between knowledge as something external, or, as it is often called, objective, and knowing as something purely internal, subjective, psychical. There is, on one side, a body of truth, ready-made, and, on the other, a ready-made mind equipped with a faculty of knowing -- if it only wills to exercise it, which it is often strangely loath to do. The separation, often touched upon, between subject matter and method is the educational equivalent of this dualism. Socially the distinction has to do with the part of life which is dependent upon authority and that where individuals are free to advance. Another dualism is that of activity and passivity in knowing. Purely empirical and physical things are often supposed to be known by receiving impressions. Physical things somehow stamp themselves upon the mind or convey themselves into consciousness by means of the sense organs. Rational knowledge and knowledge of spiritual things is supposed, on the contrary, to spring from activity initiated within the mind, an activity carried on better if it is kept remote from all sully touch of the senses and external objects. The distinction between sense training and object lessons and laboratory exercises, and pure ideas contained in books, and appropriated -- so it is thought -- by some miraculous output of mental energy, is a fair expression in education of this distinction. Socially, it reflects a division between those who are controlled by direct concern with things and those who are free to cultivate themselves.

Another current opposition is that said to exist between the intellect and the emotions. The emotions are conceived to be purely private and personal, having nothing to do with the work of pure intelligence in apprehending facts and truths, -- except perhaps the single emotion of intellectual curiosity. The intellect is a pure light; the emotions are a disturbing heat. The mind turns outward to truth; the emotions turn inward to considerations of personal advantage and loss. Thus in education we have that systematic depreciation of interest which has been noted, plus the necessity in practice, with most pupils, of recourse to extraneous and irrelevant rewards and penalties in order to induce the person who has a mind (much as his clothes have a pocket) to apply that mind to the truths to be known. Thus we have the spectacle of professional educators decrying appeal to interest while they uphold with great dignity the need of reliance upon examinations, marks, promotions and emotions, prizes, and the time-honored paraphernalia of rewards and punishments. The effect of this situation in crippling the teacher's sense of humor has not received the attention which it deserves.

All of these separations culminate in one between knowing and doing, theory and practice, between mind as the end and spirit of action and the body as its organ and means. We shall not repeat what has been said about the source of this dualism in the division of society into a class laboring with their muscles for material sustenance and a class which, relieved from economic pressure, devotes itself to the arts of expression and social direction. Nor is it necessary to speak again of the educational evils which spring from the separation. We shall be content to summarize the forces which tend to make the untenability of this conception obvious and to replace it by the idea of continuity. (i) The advance of physiology and the psychology associated with it have shown the connection of mental activity with that of the nervous system. Too often recognition of connection has stopped short at this point; the older dualism of soul and body has been replaced by that of the brain and the rest of the body. But in fact the nervous system is only a specialized mechanism for keeping all bodily activities working together. Instead of being isolated from them, as an organ of knowing from organs of motor response, it is the organ by which they interact responsively with one another. The brain is essentially an organ for effecting the reciprocal adjustment to each other of the stimuli received from the environment and responses directed upon it. Note that the adjusting is reciprocal; the brain not only enables organic activity to be brought to bear upon any object of the environment in response to a sensory stimulation, but this response also determines what the next stimulus will be. See what happens, for example, when a carpenter is at work upon a board, or an etcher

upon his plate -- or in any case of a consecutive activity. While each motor response is adjusted to the state of affairs indicated through the sense organs, that motor response shapes the next sensory stimulus. Generalizing this illustration, the brain is the machinery for a constant reorganizing of activity so as to maintain its continuity; that is to say, to make such modifications in future action as are required because of what has already been done. The continuity of the work of the carpenter distinguishes it from a routine repetition of identically the same motion, and from a random activity where there is nothing cumulative. What makes it continuous, consecutive, or concentrated is that each earlier act prepares the way for later acts, while these take account of or reckon with the results already attained -- the basis of all responsibility. No one who has realized the full force of the facts of the connection of knowing with the nervous system and of the nervous system with the readjusting of activity continuously to meet new conditions, will doubt that knowing has to do with reorganizing activity, instead of being something isolated from all activity, complete on its own account.

(ii) The development of biology clinches this lesson, with its discovery of evolution. For the philosophic significance of the doctrine of evolution lies precisely in its emphasis upon continuity of simpler and more complex organic forms until we reach man. The development of organic forms begins with structures where the adjustment of environment and organism is obvious, and where anything which can be called mind is at a minimum. As activity becomes more complex, coordinating a greater number of factors in space and time, intelligence plays a more and more marked role, for it has a larger span of the future to forecast and plan for. The effect upon the theory of knowing is to displace the notion that it is the activity of a mere onlooker or spectator of the world, the notion which goes with the idea of knowing as something complete in itself. For the doctrine of organic development means that the living creature is a part of the world, sharing its vicissitudes and fortunes, and making itself secure in its precarious dependence only as it intellectually identifies itself with the things about it, and, forecasting the future consequences of what is going on, shapes its own activities accordingly. If the living, experiencing being is an intimate participant in the activities of the world to which it belongs, then knowledge is a mode of participation, valuable in the degree in which it is effective. It cannot be the idle view of an unconcerned spectator.

(iii) The development of the experimental method as the method of getting knowledge and of making sure it is knowledge, and not mere opinion -- the method of both discovery and proof -- is the remaining great force in bringing about a

transformation in the theory of knowledge. The experimental method has two sides. (i) On one hand, it means that we have no right to call anything knowledge except where our activity has actually produced certain physical changes in things, which agree with and confirm the conception entertained. Short of such specific changes, our beliefs are only hypotheses, theories, suggestions, guesses, and are to be entertained tentatively and to be utilized as indications of experiments to be tried. (ii) On the other hand, the experimental method of thinking signifies that thinking is of avail; that it is of avail in just the degree in which the anticipation of future consequences is made on the basis of thorough observation of present conditions. Experimentation, in other words, is not equivalent to blind reacting. Such surplus activity -- a surplus with reference to what has been observed and is now anticipated -- is indeed an unescapable factor in all our behavior, but it is not experiment save as consequences are noted and are used to make predictions and plans in similar situations in the future. The more the meaning of the experimental method is perceived, the more our trying out of a certain way of treating the material resources and obstacles which confront us embodies a prior use of intelligence. What we call magic was with respect to many things the experimental method of the savage; but for him to try was to try his luck, not his ideas. The scientific experimental method is, on the contrary, a trial of ideas; hence even when practically -- or immediately -- unsuccessful, it is intellectual, fruitful; for we learn from our failures when our endeavors are seriously thoughtful.

The experimental method is new as a scientific resource--as a systematized means of making knowledge, though as old as life as a practical device. Hence it is not surprising that men have not recognized its full scope. For the most part, its significance is regarded as belonging to certain technical and merely physical matters. It will doubtless take a long time to secure the perception that it holds equally as to the forming and testing of ideas in social and moral matters. Men still want the crutch of dogma, of beliefs fixed by authority, to relieve them of the trouble of thinking and the responsibility of directing their activity by thought. They tend to confine their own thinking to a consideration of which one among the rival systems of dogma they will accept. Hence the schools are better adapted, as John Stuart Mill said, to make disciples than inquirers. But every advance in the influence of the experimental method is sure to aid in outlawing the literary, dialectic, and authoritative methods of forming beliefs which have governed the schools of the past, and to transfer their prestige to methods which will procure an active concern with things and persons, directed by aims of increasing temporal reach and deploying greater range of things in space. In time the theory of knowing must be

derived from the practice which is most successful in making knowledge; and then that theory will be employed to improve the methods which are less successful.

2. Schools of Method. There are various systems of philosophy with characteristically different conceptions of the method of knowing. Some of them are named scholasticism, sensationalism, rationalism, idealism, realism, empiricism, transcendentalism, pragmatism, etc. Many of them have been criticized in connection with the discussion of some educational problem. We are here concerned with them as involving deviations from that method which has proved most effective in achieving knowledge, for a consideration of the deviations may render clearer the true place of knowledge in experience. In brief, the function of knowledge is to make one experience freely available in other experiences. The word "freely" marks the difference between the principle of knowledge and that of habit. Habit means that an individual undergoes a modification through an experience, which modification forms a predisposition to easier and more effective action in a like direction in the future. Thus it also has the function of making one experience available in subsequent experiences. Within certain limits, it performs this function successfully. But habit, apart from knowledge, does not make allowance for change of conditions, for novelty. Prevision of change is not part of its scope, for habit assumes the essential likeness of the new situation with the old. Consequently it often leads astray, or comes between a person and the successful performance of his task, just as the skill, based on habit alone, of the mechanic will desert him when something unexpected occurs in the running of the machine. But a man who understands the machine is the man who knows what he is about. He knows the conditions under which a given habit works, and is in a position to introduce the changes which will readapt it to new conditions.

In other words, knowledge is a perception of those connections of an object which determine its applicability in a given situation. To take an extreme example; savages react to a flaming comet as they are accustomed to react to other events which threaten the security of their life. Since they try to frighten wild animals or their enemies by shrieks, beating of gongs, brandishing of weapons, etc., they use the same methods to scare away the comet. To us, the method is plainly absurd -- so absurd that we fail to note that savages are simply falling back upon habit in a way which exhibits its limitations. The only reason we do not act in some analogous fashion is because we do not take the comet as an isolated, disconnected event, but apprehend it in its connections with other events. We place it, as we say, in the astronomical system. We respond to its connections and not simply to the immediate occurrence. Thus our attitude to it is much freer. We may approach it, so

to speak, from any one of the angles provided by its connections. We can bring into play, as we deem wise, any one of the habits appropriate to any one of the connected objects. Thus we get at a new event indirectly instead of immediately -- by invention, ingenuity, resourcefulness. An ideally perfect knowledge would represent such a network of interconnections that any past experience would offer a point of advantage from which to get at the problem presented in a new experience. In fine, while a habit apart from knowledge supplies us with a single fixed method of attack, knowledge means that selection may be made from a much wider range of habits.

Two aspects of this more general and freer availability of former experiences for subsequent ones may be distinguished. (See ante, p. 77.) (i) One, the more tangible, is increased power of control. What cannot be managed directly may be handled indirectly; or we can interpose barriers between us and undesirable consequences; or we may evade them if we cannot overcome them. Genuine knowledge has all the practical value attaching to efficient habits in any case. (ii) But it also increases the meaning, the experienced significance, attaching to an experience. A situation to which we respond capriciously or by routine has only a minimum of conscious significance; we get nothing mentally from it. But wherever knowledge comes into play in determining a new experience there is mental reward; even if we fail practically in getting the needed control we have the satisfaction of experiencing a meaning instead of merely reacting physically.

While the content of knowledge is what has happened, what is taken as finished and hence settled and sure, the reference of knowledge is future or prospective. For knowledge furnishes the means of understanding or giving meaning to what is still going on and what is to be done. The knowledge of a physician is what he has found out by personal acquaintance and by study of what others have ascertained and recorded. But it is knowledge to him because it supplies the resources by which he interprets the unknown things which confront him, fills out the partial obvious facts with connected suggested phenomena, foresees their probable future, and makes plans accordingly. When knowledge is cut off from use in giving meaning to what is blind and baffling, it drops out of consciousness entirely or else becomes an object of aesthetic contemplation. There is much emotional satisfaction to be had from a survey of the symmetry and order of possessed knowledge, and the satisfaction is a legitimate one. But this contemplative attitude is aesthetic, not intellectual. It is the same sort of joy that comes from viewing a finished picture or a well composed landscape. It would make no difference if the subject matter were totally different, provided it had the same harmonious organization. Indeed, it

would make no difference if it were wholly invented, a play of fancy. Applicability to the world means not applicability to what is past and gone -- that is out of the question by the nature of the case; it means applicability to what is still going on, what is still unsettled, in the moving scene in which we are implicated. The very fact that we so easily overlook this trait, and regard statements of what is past and out of reach as knowledge is because we assume the continuity of past and future. We cannot entertain the conception of a world in which knowledge of its past would not be helpful in forecasting and giving meaning to its future. We ignore the prospective reference just because it is so irretrievably implied.

Yet many of the philosophic schools of method which have been mentioned transform the ignoring into a virtual denial. They regard knowledge as something complete in itself irrespective of its availability in dealing with what is yet to be. And it is this omission which vitiates them and which makes them stand as sponsors for educational methods which an adequate conception of knowledge condemns. For one has only to call to mind what is sometimes treated in schools as acquisition of knowledge to realize how lacking it is in any fruitful connection with the ongoing experience of the students -- how largely it seems to be believed that the mere appropriation of subject matter which happens to be stored in books constitutes knowledge. No matter how true what is learned to those who found it out and in whose experience it functioned, there is nothing which makes it knowledge to the pupils. It might as well be something about Mars or about some fanciful country unless it fructifies in the individual's own life.

At the time when scholastic method developed, it had relevancy to social conditions. It was a method for systematizing and lending rational sanction to material accepted on authority. This subject matter meant so much that it vitalized the defining and systematizing brought to bear upon it. Under present conditions the scholastic method, for most persons, means a form of knowing which has no especial connection with any particular subject matter. It includes making distinctions, definitions, divisions, and classifications for the mere sake of making them -- with no objective in experience. The view of thought as a purely physical activity having its own forms, which are applied to any material as a seal may be stamped on any plastic stuff, the view which underlies what is termed formal logic is essentially the scholastic method generalized. The doctrine of formal discipline in education is the natural counterpart of the scholastic method.

The contrasting theories of the method of knowledge which go by the name of sensationalism and rationalism correspond to an exclusive emphasis upon the

particular and the general respectively -- or upon bare facts on one side and bare relations on the other. In real knowledge, there is a particularizing and a generalizing function working together. So far as a situation is confused, it has to be cleared up; it has to be resolved into details, as sharply defined as possible. Specified facts and qualities constitute the elements of the problem to be dealt with, and it is through our sense organs that they are specified. As setting forth the problem, they may well be termed particulars, for they are fragmentary. Since our task is to discover their connections and to recombine them, for us at the time they are partial. They are to be given meaning; hence, just as they stand, they lack it. Anything which is to be known, whose meaning has still to be made out, offers itself as particular. But what is already known, if it has been worked over with a view to making it applicable to intellectually mastering new particulars, is general in function. Its function of introducing connection into what is otherwise unconnected constitutes its generality. Any fact is general if we use it to give meaning to the elements of a new experience. "Reason" is just the ability to bring the subject matter of prior experience to bear to perceive the significance of the subject matter of a new experience. A person is reasonable in the degree in which he is habitually open to seeing an event which immediately strikes his senses not as an isolated thing but in its connection with the common experience of mankind.

Without the particulars as they are discriminated by the active responses of sense organs, there is no material for knowing and no intellectual growth. Without placing these particulars in the context of the meanings wrought out in the larger experience of the past -- without the use of reason or thought -- particulars are mere excitations or irritations. The mistake alike of the sensational and the rationalistic schools is that each fails to see that the function of sensory stimulation and thought is relative to reorganizing experience in applying the old to the new, thereby maintaining the continuity or consistency of life. The theory of the method of knowing which is advanced in these pages may be termed pragmatic. Its essential feature is to maintain the continuity of knowing with an activity which purposely modifies the environment. It holds that knowledge in its strict sense of something possessed consists of our intellectual resources -- of all the habits that render our action intelligent. Only that which has been organized into our disposition so as to enable us to adapt the environment to our needs and to adapt our aims and desires to the situation in which we live is really knowledge. Knowledge is not just something which we are now conscious of, but consists of the dispositions we consciously use in understanding what now happens. Knowledge as an act is bringing some of our dispositions to consciousness with a view to

straightening out a perplexity, by conceiving the connection between ourselves and the world in which we live.

Summary. Such social divisions as interfere with free and full intercourse react to make the intelligence and knowing of members of the separated classes one-sided. Those whose experience has to do with utilities cut off from the larger end they subserve are practical empiricists; those who enjoy the contemplation of a realm of meanings in whose active production they have had no share are practical rationalists. Those who come in direct contact with things and have to adapt their activities to them immediately are, in effect, realists; those who isolate the meanings of these things and put them in a religious or so-called spiritual world aloof from things are, in effect, idealists. Those concerned with progress, who are striving to change received beliefs, emphasize the individual factor in knowing; those whose chief business it is to withstand change and conserve received truth emphasize the universal and the fixed -- and so on. Philosophic systems in their opposed theories of knowledge present an explicit formulation of the traits characteristic of these cut-off and one-sided segments of experience -- one-sided because barriers to intercourse prevent the experience of one from being enriched and supplemented by that of others who are differently situated.

In an analogous way, since democracy stands in principle for free interchange, for social continuity, it must develop a theory of knowledge which sees in knowledge the method by which one experience is made available in giving direction and meaning to another. The recent advances in physiology, biology, and the logic of the experimental sciences supply the specific intellectual instrumentalities demanded to work out and formulate such a theory. Their educational equivalent is the connection of the acquisition of knowledge in the schools with activities, or occupations, carried on in a medium of associated life.