

The Nature of Subject Matter

1. Subject Matter of Educator and of Learner

So far as the nature of subject matter in principle is concerned, there is nothing to add to what has been said (See ante, p. 134). It consists of the facts observed, recalled, read, and talked about, and the ideas suggested, in course of a development of a situation having a purpose. This statement needs to be rendered more specific by connecting it with the materials of school instruction, the studies which make up the curriculum. What is the significance of our definition in application to reading, writing, mathematics, history, nature study, drawing, singing, physics, chemistry, modern and foreign languages, and so on? Let us recur to two of the points made earlier in our discussion. The educator's part in the enterprise of education is to furnish the environment which stimulates responses and directs the learner's course. In last analysis, all that the educator can do is modify stimuli so that response will as surely as is possible result in the formation of desirable intellectual and emotional dispositions. Obviously studies or the subject matter of the curriculum have intimately to do with this business of supplying an environment. The other point is the necessity of a social environment to give meaning to habits formed. In what we have termed informal education, subject matter is carried directly in the matrix of social intercourse. It is what the persons with whom an individual associates do and say. This fact gives a clue to the understanding of the subject matter of formal or deliberate instruction. A connecting link is found in the stories, traditions, songs, and liturgies which accompany the doings and rites of a primitive social group. They represent the stock of meanings which have been precipitated out of previous experience, which are so prized by the group as to be identified with their conception of their own collective life. Not being obviously a part of the skill exhibited in the daily occupations of eating, hunting, making war and peace, constructing rugs, pottery, and baskets, etc., they are consciously impressed upon the young; often, as in the initiation ceremonies, with intense emotional fervor. Even more pains are consciously taken to perpetuate the myths, legends, and sacred verbal formulae of the group than to transmit the directly useful customs of the group just because they cannot be picked up, as the latter can be in the ordinary processes of association.

As the social group grows more complex, involving a greater number of acquired skills which are dependent, either in fact or in the belief of the group, upon standard ideas deposited from past experience, the content of social life gets more definitely formulated for purposes of instruction. As we have previously noted, probably the chief motive for consciously dwelling upon the group life, extracting the meanings which are regarded as most important and systematizing them in a coherent arrangement, is just the need of instructing the young so as to perpetuate group life. Once started on this road of selection, formulation, and organization, no definite limit exists. The invention of writing and of printing gives the operation an immense impetus. Finally, the bonds which connect the subject matter of school study with the habits and ideals of the social group are disguised and covered up. The ties are so loosened that it often appears as if there were none; as if subject matter existed simply as knowledge on its own independent behoof, and as if study were the mere act of mastering it for its own sake, irrespective of any social values. Since it is highly important for practical reasons to counter-act this tendency (See ante, p. 8) the chief purposes of our theoretical discussion are to make clear the connection which is so readily lost from sight, and to show in some detail the social content and function of the chief constituents of the course of study.

The points need to be considered from the standpoint of instructor and of student. To the former, the significance of a knowledge of subject matter, going far beyond the present knowledge of pupils, is to supply definite standards and to reveal to him the possibilities of the crude activities of the immature. (i) The material of school studies translates into concrete and detailed terms the meanings of current social life which it is desirable to transmit. It puts clearly before the instructor the essential ingredients of the culture to be perpetuated, in such an organized form as to protect him from the haphazard efforts he would be likely to indulge in if the meanings had not been standardized. (ii) A knowledge of the ideas which have been achieved in the past as the outcome of activity places the educator in a position to perceive the meaning of the seeming impulsive and aimless reactions of the young, and to provide the stimuli needed to direct them so that they will amount to something. The more the educator knows of music the more he can perceive the possibilities of the inchoate musical impulses of a child. Organized subject matter represents the ripe fruitage of experiences like theirs, experiences involving the same world, and powers and needs similar to theirs. It does not represent perfection or infallible wisdom; but it is the best at command to further new experiences which may, in some respects at least, surpass the achievements embodied in existing knowledge and works of art.

From the standpoint of the educator, in other words, the various studies represent working resources, available capital. Their remoteness from the experience of the young is not, however, seeming; it is real. The subject matter of the learner is not, therefore, it cannot be, identical with the formulated, the crystallized, and systematized subject matter of the adult; the material as found in books and in works of art, etc. The latter represents the possibilities of the former; not its existing state. It enters directly into the activities of the expert and the educator, not into that of the beginner, the learner. Failure to bear in mind the difference in subject matter from the respective standpoints of teacher and student is responsible for most of the mistakes made in the use of texts and other expressions of preexistent knowledge.

The need for a knowledge of the constitution and functions, in the concrete, of human nature is great just because the teacher's attitude to subject matter is so different from that of the pupil. The teacher presents in actuality what the pupil represents only in posse. That is, the teacher already knows the things which the student is only learning. Hence the problem of the two is radically unlike. When engaged in the direct act of teaching, the instructor needs to have subject matter at his fingers' ends; his attention should be upon the attitude and response of the pupil. To understand the latter in its interplay with subject matter is his task, while the pupil's mind, naturally, should be not on itself but on the topic in hand. Or to state the same point in a somewhat different manner: the teacher should be occupied not with subject matter in itself but in its interaction with the pupils' present needs and capacities. Hence simple scholarship is not enough. In fact, there are certain features of scholarship or mastered subject matter - taken by itself - which get in the way of effective teaching unless the instructor's habitual attitude is one of concern with its interplay in the pupil's own experience. In the first place, his knowledge extends indefinitely beyond the range of the pupil's acquaintance. It involves principles which are beyond the immature pupil's understanding and interest. In and of itself, it may no more represent the living world of the pupil's experience than the astronomer's knowledge of Mars represents a baby's acquaintance with the room in which he stays. In the second place, the method of organization of the material of achieved scholarship differs from that of the beginner. It is not true that the experience of the young is unorganized - that it consists of isolated scraps. But it is organized in connection with direct practical centers of interest. The child's home is, for example, the organizing center of his geographical knowledge. His own movements about the locality, his journeys abroad, the tales of his friends, give the ties which hold his items of information together. But the geography of the geographer, of the one who has already developed the implications of these smaller experiences, is organized on the basis of the relationship which the various facts bear to one another - not the relations which they bear to his house, bodily movements, and friends. To the one who is learned, subject matter is extensive, accurately defined, and logically interrelated. To the one who is learning, it is fluid, partial, and connected through his personal occupations. 1 The problem of teaching is to keep the experience of the student moving in the direction of what the expert already knows. Hence the need that the teacher know both subject matter and the characteristic needs and capacities of the student.

2. The Development of Subject Matter in the Learner

It is possible, without doing violence to the facts, to mark off three fairly typical stages in the growth of subject matter in the experience of the learner. In its first estate, knowledge exists as the content of intelligent ability - power to do. This kind of subject matter, or known material, is expressed in familiarity or acquaintance with things. Then this material gradually is surcharged and deepened through communicated knowledge or information. Finally, it is enlarged and worked over into rationally or logically organized material - that of the one who, relatively speaking, is expert in the subject.

I. The knowledge which comes first to persons, and that remains most deeply ingrained, is knowledge of how to do; how to walk, talk, read, write, skate, ride a bicycle, manage a machine, calculate, drive a horse, sell goods, manage people, and so on indefinitely. The popular tendency to regard instinctive acts which are adapted to an end as a sort of miraculous knowledge, while unjustifiable, is evidence of the strong tendency to identify intelligent control of the means of action with knowledge. When education, under the influence of a scholastic conception of knowledge which ignores everything but scientifically formulated facts and truths, fails to recognize that primary or initial subject matter always exists as matter of an active doing, involving the use of the body and the handling of material, the subject matter of instruction is isolated from the needs and purposes of the learner, and so becomes just a something to be memorized and reproduced upon demand. Recognition of the natural course of development, on the contrary, always sets out with situations which involve learning by doing. Arts and occupations form the initial stage of the curriculum, corresponding as they do to knowing how to go about the accomplishment of ends. Popular terms denoting knowledge have always retained the connection with ability in action lost by academic philosophies. *Ken* and *can* are allied words. *Attention* means caring for a thing, in the sense of both affection and of looking out for its welfare. *Mind* means carrying out instructions in action - as a child minds his mother - and taking care of something - as a nurse minds the baby. To be thoughtful, considerate, means to heed the claims of others. *Apprehension* means dread of undesirable consequences, as well as intellectual grasp. To have good sense or judgment is to know the conduct a situation calls for; discernment is not making distinctions for the sake of making them, an exercise reprobated as hair splitting, but is insight into an affair with reference to acting. *Wisdom* has never lost its association with the proper direction of life. Only in education, never in the life of farmer, sailor, merchant, physician, or laboratory experimenter, does knowledge mean primarily a store of information aloof from doing. Having to do with things in an intelligent way issues in acquaintance or familiarity. The things we are best acquainted with are the things we put to frequent use - such things as chairs, tables, pen, paper, clothes, food, knives and forks on the commonplace level, differentiating into more special objects according to a person's occupations in life. Knowledge of things in that intimate and emotional sense suggested by the word acquaintance is a precipitate from our employing them with a purpose. We have acted with or upon the thing so frequently that we can anticipate how it will act and react - such is the meaning of familiar acquaintance. We are ready for a familiar thing; it does not catch us napping, or play unexpected tricks with us. This attitude carries with it a sense of congeniality or friendliness, of ease and illumination; while the things with which we are not accustomed to deal are strange, foreign, cold, remote, "abstract."

II. But it is likely that elaborate statements regarding this primary stage of knowledge will darken understanding. It includes practically all of our knowledge which is not the result of deliberate technical study. Modes of purposeful doing include dealings with persons as well as things. Impulses of communication and habits of intercourse have to be adapted to maintaining successful connections with others; a large fund of social knowledge accrues. As a part of this intercommunication one learns much from others. They tell of their experiences and of the experiences which, in turn, have been told them. In so far as one is interested or concerned in these communications, their matter becomes a part of one's own experience. Active connections with others are such an intimate and vital part of our own concerns that it is impossible to draw sharp lines, such as would enable us to say, "Here my experience ends; there yours begins." In so far as we are partners in common undertakings, the things which others communicate to us as the consequences of their particular share in the enterprise blend at once into the experience resulting from our own special doings. The ear is as much an organ of experience as the eye or hand; the eye is available for reading reports of what happens beyond its horizon. Things remote in space and time affect the issue of our actions quite as much as things which we can smell

and handle. They really concern us, and, consequently, any account of them which assists us in dealing with things at hand falls within personal experience.

Information is the name usually given to this kind of subject matter. The place of communication in personal doing supplies us with a criterion for estimating the value of informational material in school. Does it grow naturally out of some question with which the student is concerned? Does it fit into his more direct acquaintance so as to increase its efficacy and deepen its meaning? If it meets these two requirements, it is educative. The amount heard or read is of no importance - the more the better, provided the student has a need for it and can apply it in some situation of his own.

But it is not so easy to fulfill these requirements in actual practice as it is to lay them down in theory. The extension in modern times of the area of intercommunication; the invention of appliances for securing acquaintance with remote parts of the heavens and bygone events of history; the cheapening of devices, like printing, for recording and distributing information - genuine and alleged - have created an immense bulk of communicated subject matter. It is much easier to swamp a pupil with this than to work it into his direct experiences. All too frequently it forms another strange world which just overlies the world of personal acquaintance. The sole problem of the student is to learn, for school purposes, for purposes of recitations and promotions, the constituent parts of this strange world. Probably the most conspicuous connotation of the word knowledge for most persons to-day is just the body of facts and truths ascertained by others; the material found in the rows and rows of atlases, cyclopedias, histories, biographies, books of travel, scientific treatises, on the shelves of libraries.

The imposing stupendous bulk of this material has unconsciously influenced men's notions of the nature of knowledge itself. The statements, the propositions, in which knowledge, the issue of active concern with problems, is deposited, are taken to be themselves knowledge. The record of knowledge, independent of its place as an outcome of inquiry and a resource in further inquiry, is taken to be knowledge. The mind of man is taken captive by the spoils of its prior victories; the spoils, not the weapons and the acts of waging the battle against the unknown, are used to fix the meaning of knowledge, of fact, and truth.

If this identification of knowledge with propositions stating information has fastened itself upon logicians and philosophers, it is not surprising that the same ideal has almost dominated instruction. The "course of study" consists largely of information distributed into various branches of study, each study being subdivided into lessons presenting in serial cutoff portions of the total store. In the seventeenth century, the store was still small enough so that men set up the ideal of a complete encyclopedic mastery of it. It is now so bulky that the impossibility of any one man's coming into possession of it all is obvious. But the educational ideal has not been much affected. Acquisition of a modicum of information in each branch of learning, or at least in a selected group, remains the principle by which the curriculum, from elementary school through college, is formed; the easier portions being assigned to the earlier years, the more difficult to the later. The complaints of educators that learning does not enter into character and affect conduct; the protests against memoriter work, against cramming, against gradgrind preoccupation with "facts," against devotion to wire-drawn distinctions and ill-understood rules and principles, all follow from this state of affairs. Knowledge which is mainly second-hand, other men's knowledge, tends to become merely verbal. It is no objection to information that it is clothed in words; communication necessarily takes place through words. But in the degree in which what is communicated cannot be organized into the existing experience of the learner, it becomes mere words: that is, pure sense-stimuli, lacking in meaning. Then it operates to call out mechanical reactions, ability to use the vocal organs to repeat statements, or the hand to write or to do "sums."

To be informed is to be posted; it is to have at command the subject matter needed for an effective dealing with a problem, and for giving added significance to the search for solution and to the solution itself. Informational knowledge is the material which can be fallen back upon as given, settled, established, assured in a doubtful situation. It is a kind of bridge for mind in its passage from doubt to discovery. It has the office of an intellectual middleman. It condenses and records in available form the net results of the prior experiences of mankind, as an agency of enhancing the meaning of new experiences. When one is told that Brutus assassinated Caesar, or that the length of the year is three hundred sixty-five and one fourth days, or that the ratio of the diameter of the circle to its circumference is 3.1415. . .

one receives what is indeed knowledge for others, but for him it is a stimulus to knowing. His acquisition of knowledge depends upon his response to what is communicated.

3. Science or Rationalized Knowledge

Science is a name for knowledge in its most characteristic form. It represents in its degree, the perfected outcome of learning, - its consummation. What is known, in a given case, is what is sure, certain, settled, disposed of; that which we think with rather than that which we think about. In its honorable sense, knowledge is distinguished from opinion, guesswork, speculation, and mere tradition. In knowledge, things are ascertained; they are so and not dubiously otherwise. But experience makes us aware that there is difference between intellectual certainty of subject matter and our certainty. We are made, so to speak, for belief; credulity is natural. The undisciplined mind is averse to suspense and intellectual hesitation; it is prone to assertion. It likes things undisturbed, settled, and treats them as such without due warrant. Familiarity, common repute, and congeniality to desire are readily made measuring rods of truth. Ignorance gives way to opinionated and current error, - a greater foe to learning than ignorance itself. A Socrates is thus led to declare that consciousness of ignorance is the beginning of effective love of wisdom, and a Descartes to say that science is born of doubting.

We have already dwelt upon the fact that subject matter, or data, and ideas have to have their worth tested experimentally: that in themselves they are tentative and provisional. Our predilection for premature acceptance and assertion, our aversion to suspended judgment, are signs that we tend naturally to cut short the process of testing. We are satisfied with superficial and immediate short-visioned applications. If these work out with moderate satisfactoriness, we are content to suppose that our assumptions have been confirmed. Even in the case of failure, we are inclined to put the blame not on the inadequacy and incorrectness of our data and thoughts, but upon our hard luck and the hostility of circumstance. We charge the evil consequence not to the error of our schemes and our incomplete inquiry into conditions (thereby getting material for revising the former and stimulus for extending the latter) but to untoward fate. We even plume ourselves upon our firmness in clinging to our conceptions in spite of the way in which they work out.

Science represents the safeguard of the race against these natural propensities and the evils which flow from them. It consists of the special appliances and methods which the race has slowly worked out in order to conduct reflection under conditions whereby its procedures and results are tested. It is artificial (an acquired art), not spontaneous; learned, not native. To this fact is due the unique, the invaluable place of science in education, and also the dangers which threaten its right use. Without initiation into the scientific spirit one is not in possession of the best tools which humanity has so far devised for effectively directed reflection. One in that case not merely conducts inquiry and learning without the use of the best instruments, but fails to understand the full meaning of knowledge. For he does not become acquainted with the traits that mark off opinion and assent from authorized conviction. On the other hand, the fact that science marks the perfecting of knowing in highly specialized conditions of technique renders its results, taken by themselves, remote from ordinary experience - a quality of aloofness that is popularly designated by the term abstract. When this isolation appears in instruction, scientific information is even more exposed to the dangers attendant upon presenting ready-made subject matter than are other forms of information.

Science has been defined in terms of method of inquiry and testing. At first sight, this definition may seem opposed to the current conception that science is organized or systematized knowledge. The opposition, however, is only seeming, and disappears when the ordinary definition is completed. Not organization but the kind of organization effected by adequate methods of tested discovery marks off science. The knowledge of a farmer is systematized in the degree in which he is competent. It is organized on the basis of relation of means to ends - practically organized. Its organization as knowledge (that is, in the eulogistic sense of adequately tested and confirmed) is incidental to its organization with reference to securing crops, live-stock, etc. But scientific subject matter is organized with specific reference to the successful conduct of the enterprise of discovery, to knowing as a specialized undertaking. Reference to the kind of assurance attending science will shed light upon this statement. It is rational assurance, - logical warranty. The ideal of scientific organization is, therefore, that every conception and statement shall be of such a kind as to follow from others

and to lead to others. Conceptions and propositions mutually imply and support one another. This double relation of "leading to and confirming" is what is meant by the terms logical and rational. The everyday conception of water is more available for ordinary uses of drinking, washing, irrigation, etc., than the chemist's notion of it. The latter's description of it as H₂O is superior from the standpoint of place and use in inquiry. It states the nature of water in a way which connects it with knowledge of other things, indicating to one who understands it how the knowledge is arrived at and its bearings upon other portions of knowledge of the structure of things. Strictly speaking, it does not indicate the objective relations of water any more than does a statement that water is transparent, fluid, without taste or odor, satisfying to thirst, etc. It is just as true that water has these relations as that it is constituted by two molecules of hydrogen in combination with one of oxygen. But for the particular purpose of conducting discovery with a view to ascertainment of fact, the latter relations are fundamental. The more one emphasizes organization as a mark of science, then, the more he is committed to a recognition of the primacy of method in the definition of science. For method defines the kind of organization in virtue of which science is science.

4. Subject Matter as Social

Our next chapters will take up various school activities and studies and discuss them as successive stages in that evolution of knowledge which we have just been discussing. It remains to say a few words upon subject matter as social, since our prior remarks have been mainly concerned with its intellectual aspect. A difference in breadth and depth exists even in vital knowledge; even in the data and ideas which are relevant to real problems and which are motivated by purposes. For there is a difference in the social scope of purposes and the social importance of problems. With the wide range of possible material to select from, it is important that education (especially in all its phases short of the most specialized) should use a criterion of social worth. All information and systematized scientific subject matter have been worked out under the conditions of social life and have been transmitted by social means. But this does not prove that all is of equal value for the purposes of forming the disposition and supplying the equipment of members of present society. The scheme of a curriculum must take account of the adaptation of studies to the needs of the existing community life; it must select with the intention of improving the life we live in common so that the future shall be better than the past. Moreover, the curriculum must be planned with reference to placing essentials first, and refinements second. The things which are socially most fundamental, that is, which have to do with the experiences in which the widest groups share, are the essentials. The things which represent the needs of specialized groups and technical pursuits are secondary. There is truth in the saying that education must first be human and only after that professional. But those who utter the saying frequently have in mind in the term human only a highly specialized class: the class of learned men who preserve the classic traditions of the past. They forget that material is humanized in the degree in which it connects with the common interests of men as men. Democratic society is peculiarly dependent for its maintenance upon the use in forming a course of study of criteria which are broadly human. Democracy cannot flourish where the chief influences in selecting subject matter of instruction are utilitarian ends narrowly conceived for the masses, and, for the higher education of the few, the traditions of a specialized cultivated class. The notion that the "essentials" of elementary education are the three R's mechanically treated, is based upon ignorance of the essentials needed for realization of democratic ideals. Unconsciously it assumes that these ideals are unrealizable; it assumes that in the future, as in the past, getting a livelihood, "making a living," must signify for most men and women doing things which are not significant, freely chosen, and ennobling to those who do them; doing things which serve ends unrecognized by those engaged in them, carried on under the direction of others for the sake of pecuniary reward. For preparation of large numbers for a life of this sort, and only for this purpose, are mechanical efficiency in reading, writing, spelling and figuring, together with attainment of a certain amount of muscular dexterity, "essentials." Such conditions also infect the education called liberal, with illiberality. They imply a somewhat parasitic cultivation bought at the expense of not having the enlightenment and discipline which come from concern with the deepest problems of common humanity. A curriculum which acknowledges the social responsibilities of education must present situations where problems are relevant to the problems of living together, and where observation and information are calculated to develop social insight and interest.

Summary

The subject matter of education consists primarily of the meanings which supply content to existing social life. The continuity of social life means that many of these meanings are contributed to present activity by past collective experience. As social life grows more complex, these factors increase in number and import. There is need of special selection, formulation, and organization in order that they may be adequately transmitted to the new generation. But this very process tends to set up subject matter as something of value just by itself, apart from its function in promoting the realization of the meanings implied in the present experience of the immature. Especially is the educator exposed to the temptation to conceive his task in terms of the pupil's ability to appropriate and reproduce the subject matter in set statements, irrespective of its organization into his activities as a developing social member. The positive principle is maintained when the young begin with active occupations having a social origin and use, and proceed to a scientific insight in the materials and laws involved, through assimilating into their more direct experience the ideas and facts communicated by others who have had a larger experience. 1 Since the learned man should also still be a learner, it will be understood that these contrasts are relative, not absolute. But in the earlier stages of learning at least they are practically all-important.



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