HOW WE THINK

A RESTATEMENT OF THE RELATION
OF REFLECTIVE THINKING TO
THE EDUCATIVE PROCESS

BY

JOHN DEWEY

PROFESSOR EMERITUS OF PHILOSOPHY
COLUMBIA UNIVERSITY

D. C. HEATH AND COMPANY
BOSTON
CHAPTER FIFTEEN
FROM THE CONCRETE TO THE ABSTRACT

I. WHAT IS THE CONCRETE?

The maxim enjoined upon teachers, "proceed from the concrete to the abstract," is familiar rather than wholly intelligible. Few who read and hear it gain a clear conception of the starting point, the concrete; of the nature of the goal, the abstract; and of the exact nature of the path to be traversed in going from one to the other. At times the injunction is positively misunderstood, being taken to mean that education should advance from things to thought — as if any dealing with things in which thinking is not involved could possibly be educative. So understood, the maxim encourages mechanical routine or senseless excitement at one end of the educational scale — the lower — and academic and unapplied learning at the upper end.

Actually, all dealing with things, even the child's, is immersed in inference; things are clothed with the suggestions they arouse. They are significant as challenges to interpretation or as evidences to substantiate a belief. Nothing could be more unnatural than instruction in things without thought, in sense-perceptions without judgments connected with them. And if the abstract to which we are to proceed denotes thought apart from things, the goal is formal and empty, for effective thought always refers, more or less directly, to things.

FROM CONCRETE TO ABSTRACT

Relation to Direct and Indirect Meaning

Yet the maxim has a meaning which, understood and supplemented, states the direction of logical development. What is this meaning? 'Concrete' denotes a meaning definitely marked off from other meanings so that it is readily apprehended by itself. When we hear the words, table, chair, stove, coat, we do not have to reflect in order to grasp what is meant.\(^1\) The terms convey meaning so directly that no effort at translation is needed. The meaning of some terms and things, however, is grasped only by first calling to mind more familiar things and then tracing out connections between them and what we do not understand. Roughly speaking, the former kind of meaning is concrete; the latter is abstract.

Dependence on the Intellectual Status of the Individual

To one who is thoroughly at home in physics and chemistry, the notions of atom and molecule are fairly concrete. They are constantly used without involving any labor of thought in apprehending what they mean. But the layman and the beginner in science have to remind themselves of things with which they already are well acquainted, and then go through a process of slow translation. Moreover the terms atom and molecule lose their hard-won meaning only too easily if familiar things and the line of transition from them to the strange drop out of mind. The same difference is illustrated by any technical terms: coefficient and exponent in algebra, triangle and square in their geometric as distinct from their popular meanings; capital and value in political economy, and so on.

The difference as noted is purely relative to the intellectual progress of an individual; what is abstract at one pe-\(^1\) See page 150.
period of growth is concrete at another; or even the contrary, as one finds that things supposed to be thoroughly familiar involve strange factors and unsolved problems. There is, nevertheless, a general line of cleavage that divides upon the whole what things fall within, and what fall without, the limits of familiar acquaintance. This line accordingly marks off the concrete and the abstract in a fairly permanent way. The limits are fixed mainly by the demands of practical life. Things such as sticks and stones, meat and potatoes, houses and trees, are constant features of the environment of which we have to take account in order to live. Hence their important meanings are soon learned and are indissolubly associated with objects. We are acquainted with a thing (or it is familiar to us) when we have so much to do with it that its strange and troublesome corners are rubbed off. The necessities of social intercourse convey to adults a like concreteness upon such terms as taxes, elections, wages, the law, and so on. Things the meaning of which I personally do not take in directly, appliances of cook, carpenter, or weaver, for example, are nevertheless unhesitatingly classed as concrete, since they are directly connected with our common social life.

Relation to Thinking as a Means and as an End

By contrast, the abstract is the theoretical, that not intimately associated with practical concerns. The abstract thinker (the 'man of pure science,' as he is sometimes called) deliberately abstracts from application in life; that is, he leaves practical uses out of account. This, however, is a merely negative statement. What remains when connections with use and application are excluded? Evidently only what has to do with knowing considered as an end in itself. Many notions in science are abstract, not only because they cannot be understood without a long apprenticeship in the science (which is equally true of technical matters in the arts), but also because the whole content of their meaning has been framed for the sole purpose of facilitating further knowledge, inquiry, and speculation. When thinking is used as a means to some end, good, or value beyond itself, it is concrete; when it is employed simply as a means to more thinking, it is abstract. To a theorist an idea is adequate and self-contained just because it engages and rewards thought; to a medical practitioner, an engineer, an artist, a merchant, a politician, it is complete only when employed in the furthering of some interest in life—health, wealth, beauty, goodness, success, or what you will.

Depreciation of 'Mere Theory'

The great majority of men under ordinary circumstances find the practical exigencies of life almost, if not quite, coercive. Their main business is the proper conduct of their affairs. Whatever is of significance only as affording scope for thinking is pallid and remote—almost artificial. Hence the contempt felt by the practical and successful executive for the 'mere theorist'; hence his conviction that certain things may be all very well in theory, but that they will not do in practice; hence, in general, the depreciatory way in which he uses the terms abstract, theoretical, and intellectual.

This attitude is justified, of course, under certain conditions. But depreciation of theory does not contain the whole truth, as common or practical sense recognizes. There is such a thing, even from the common-sense standpoint, as being 'too practical,' as being so intent upon the immediately practical as not to see beyond the end of one's nose or as to cut off the limb upon which one is sitting. The question is one of limits, of degrees and adjustments, rather than
one of absolute separation. Truly practical men give their minds free play about a subject without asking too closely at every point for any advantage to be gained. Exclusive preoccupation with matters of use and application narrows the horizon and in the long run defeats itself. It does not pay to tether one's thoughts to the pest of use with too short a rope. Power in action requires largeness of vision, which can be had only through the use of imagination. Men must at least have enough interest in thinking for the sake of thinking to escape the limitations of routine and custom. Interest in knowledge for the sake of knowledge, in thinking for the sake of the free play of thought, is necessary to the emancipation of practical life — to making it rich and progressive.

We now recur to the pedagogic maxim of going from the concrete to the abstract and call attention to three aspects of the process.

Beginning with Practical Manipulations

1. Since the concrete denotes thinking applied to activities for the sake of dealing with difficulties that present themselves practically, 'begin with the concrete' signifies that we should, at the outset of any new experience in learning, make much of what is already familiar, and if possible connect the new topics and principles with the pursuit of an end in some active occupation. We do not 'follow the order of nature' when we multiply mere sensations or accumulate physical objects. Instruction in number is not concrete merely because splints or beans or dots are employed. Whenever the use and bearing of number relations are clearly perceived, a number idea is concrete even if figures alone are used. Just what sort of symbol it is best to use at a given time — whether blocks, or lines, or figures — is entirely a matter of adjustment to the given case. If the physical things used in teaching number or geography or anything else do not leave the mind illuminated with recognition of a meaning beyond themselves, the instruction that uses them is as abstruse as that which does out ready-made definitions and rules, it for it distracts attention from ideas to mere physical excitements.

The notion that we have only to put physical objects before the senses in order to impress ideas upon the mind amounts almost to a superstition. The introduction of object lessons and sense-training scored a distinct advance over the prior method of linguistic symbols, but this advance tended to blind educators to the fact that only a half-way step had been taken. Things and sensations develop the child, indeed, but only when he uses them in mastering his body and coordinating his actions. Continuous occupations involve the use of natural materials, tools, modes of energy, and do it in a way that compels thinking as to how they are related to one another and to the realization of ends. But the mere isolated presentation of things to sense remains barren and dead. A few generations ago the great obstacle in the way of reform of primary education was belief in the almost magical efficacy of the symbols of language (including number) to produce mental training; at present, belief in the efficacy of objects just as objects blocks the way. As frequently happens, the better is an enemy of the best.

Transferring Interest to Intellectual Matters

2. The interest in results, in the successful carrying on of an activity, should be gradually transferred to the study of objects — their properties, consequences, structures, causes, and effects. The adult when at work in his life calling is rarely free to devote time or energy — beyond the necessitiies of his immediate action — to the study of what he deals with. The educative activities of childhood should be so

2 See page 50.
arranged that the activity creates a demand for attention to matters that have only an indirect and an intellectual connection with the original activity. To take an instance to which reference has already been made, the direct interest in carpentering or shop work should gradually pass into an interest in geometric and mechanical problems. The interest in cooking should grow into an interest in chemical experimentation and the physiology and hygiene of bodily growth. The original casual making of pictures should pass to an interest in the technique of representation of perspective, the handling of brush, pigments, etc. This development is what the term "go" signifies in the maxim "go from the concrete to the abstract"; it represents the dynamic and educative phase of the process.

Developing Delight in Thinking

3. The outcome, the abstract to which education is to proceed, is an interest in intellectual matters for their own sake, a delight in thinking for the sake of thinking. It is an old story that acts and processes that at the outset are incidental to something else develop and maintain an absorbing value of their own. So it is with thinking and with knowledge; at first incidental to results and adjustments beyond themselves, they attract more and more attention to themselves till they become ends, not means. Children engage, unconstrainedly and continually, in reflective inspection and testing for the sake of what they are interested in doing. Habits of thinking thus generated may increase in amount till they become of importance on their own account. It is part of the business of a teacher to lead students to extricate and dwell upon the distinctively intellectual side of what they do until there develops a spontaneous interest in ideas and their relations with one another—that is, a genuine power of abstraction, of rising from engrossment in the present to the plane of ideas.

II. What Is the Abstract?

Examples of the Transition from Concrete to Abstract

The three instances cited in Chapter VI represent an ascending cycle from the concrete to the abstract. Taking thought to keep a personal engagement is obviously of the concrete kind. Endeavoring to work out the meaning of a certain part of a boat is an instance of an intermediate kind. The original reason for the existence and position of the pole is practical, so that to the designer the problem was purely concrete—the maintenance of a certain system of action. But for the passenger on the boat, the problem was theoretical, more or less speculative. It made no difference to his reaching his destination whether he worked out the meaning or not. The third case, that of the appearance and movement of the bubbles, illustrates a strictly abstract case. No overcoming of physical obstacles, no adjustment of external means to ends, is at stake. Curiosity, intellectual curiosity, is challenged by a seemingly anomalous occurrence; and thinking tries simply to account for an apparent exception in terms of recognized principles. Intellectual means are adjusted to an intellectual result.

Abstract Thinking Not the Whole End and Not Congenial to Most Persons

Abstract thinking, it should be noted, represents an end, not the end. The power of sustained thinking on matters remote from direct use is an outgrowth of thinking on practical and immediate matters, but not a substitute for it. The educational end is not the destruction of power to think practically in overcoming obstacles, utilizing resources, and achieving ends; it is not its replacement by abstract reflect-
tion. Nor is theoretical thinking a higher type of thinking than practical. A person who has at command both types of thinking is of a higher order than he who possesses only one. Methods that, in developing abstract intellectual abilities, weaken habits of practical or concrete thinking fall as much short of the educational ideal as do the methods that, in cultivating ability to plan, to invent, to arrange, to forecast, fail to secure some delight in thinking, irrespective of practical consequences.

Educators should also note the very great individual differences that exist; they should not try to force one pattern and model upon all. In many (probably the majority) the executive tendency, the habit of mind that thinks for purposes of conduct and achievement, not for the sake of knowing, remains dominant to the end. Engineers, lawyers, doctors, merchants, are much more numerous in adult life than scientists and philosophers. While education should strive to make men who, however prominent their professional interests and aims, partake of the spirit of the scholar, philosopher, and scientist, no good reason appears why education should esteem the one mental habit inherently superior to the other and deliberately try to transform the type from concrete to abstract. Have not our schools been one-sidedly devoted to the more abstract type of thinking, thus doing injustice to the majority of pupils? Has not the idea of a 'liberal' and 'humane' education tended too often in practice to the production of technical, because overspecialized, thinkers?

Education Should Aim to Secure a Working Balance

The aim of education should be to secure a balanced interaction of the two types of mental attitude, having sufficient regard to the disposition of the individual not to hamper and cripple whatever powers are naturally strong in him. The narrowness of individuals of strong concrete bent needs to be liberalized. Every opportunity that occurs within practical activities for developing curiosity and susceptibility to intellectual problems should be seized. Violence is not done to natural disposition; rather the latter is broadened. Otherwise, the concrete becomes narrowing and deadening. As regards the smaller number of those who have a taste for abstract, purely intellectual topics, pains should be taken to multiply opportunities for the application of ideas, for translating symbolic truths into terms of everyday and social life. Every human being has both capabilities, and every individual will be more effective and happier if both powers are developed in easy and close interaction with each other. Otherwise the abstract becomes identical with the academic and pedantic.