

How We Think John Dewey

by
John Dewey

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How We Think

John Dewey

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Chapter One—*What is Thought?*

§1. *Varied Senses of the Term*

No words are oftener on our lips than thinking and thought. So profuse and varied, indeed, is our use of these words that it is not easy to define just what we mean by them. The aim of this chapter is to find a single consistent meaning. Assistance may be had by considering some typical ways in which the terms are employed. In the first place thought is used broadly, not to say loosely.

Everything that comes to mind, that "goes through our heads," is called a thought. To think of a thing is just to be conscious of it in any way whatsoever. Second, the term is restricted by excluding whatever is directly presented; we think (or think of) only such things as we do not directly see, hear, smell, or taste. Then, third, the meaning is further limited to beliefs that rest upon some kind of evidence or testimony. Of this third type, two kinds—or, rather, two degrees—must be discriminated. In some cases, a belief is accepted with slight or almost no attempt to state the grounds that support it. In other cases, the ground or basis for a belief is deliberately sought and its adequacy to support the belief examined. This process is called reflective thought; it alone is truly educative in value, and it forms, accordingly, the principal subject of this volume. We shall now briefly describe each of the four senses.

1. In its loosest sense, thinking signifies everything that, as we say, is "in our heads" or that "goes through our minds." One who offers "a penny for your thoughts" does not expect to drive any great bargain. In calling the objects of their demand *thoughts*, they do not intend to ascribe to them dignity, consecutiveness, or truth. Any idle fancy, trivial recollection, or flitting impression will satisfy his demand. Daydreaming, building of castles in the air, that loose flux of casual and disconnected material that floats through our minds in relaxed moments are, in this random sense, *thinking*. More of our waking life than we should care to admit, even to ourselves, is likely to be whiled away in this inconsequential trifling with idle fancy and unsubstantial hope.

In this sense, silly folk and dullards *think*. The story is told of a man in slight repute for intelligence, who, desiring to be chosen selectman in his New England town, addressed a knot of neighbors in this wise: "I hear you don't believe I know enough to hold office. I wish you to

understand that I am thinking about something or other most of the time." Now reflective thought is like this random coursing of things through the mind in that it consists of a succession of things thought of; but it is unlike, in that the mere chance occurrence of any chance "something or other" in an irregular sequence does not suffice. Reflection involves not simply a sequence of ideas, but a consequence—a consecutive ordering in such a way that each determines the next as its proper outcome, while each in turn leans back on its predecessors. The successive portions of the reflective thought grow out of one another and support one another; they do not come and go in a medley. Each phase is a step from something to something—technically speaking, it is a term of thought. Each term leaves a deposit which is utilized in the next term. The stream or flow becomes a train, chain, or thread.

2. Even when thinking is used in a broad sense, it is usually restricted to matters not directly perceived: to what we do not see, smell, hear, or touch. We ask someone telling a story if they saw a certain incident happen, and their reply may be, "No, I only thought of it." A note of invention, as distinct from faithful record of observation, is present. Most important in this class are successions of imaginative incidents and episodes which, having a certain coherence, hanging together on a continuous thread, lie between kaleidoscopic flights of fancy and considerations deliberately employed to establish a conclusion. The imaginative stories poured forth by children possess all degrees of internal congruity; some are disjointed, some are articulated. When connected, they simulate reflective thought; indeed, they usually occur in minds of logical capacity. These imaginative enterprises often precede thinking of the close-knit type and prepare the way for it. *But they do not aim at knowledge, at belief about facts or in truths;* and thereby they are marked off from reflective thought even when they most resemble it. Those who express such thoughts do not expect credence, but rather credit for a well-constructed plot or a well-arranged climax. They produce good stories, not—unless by chance—knowledge. Such thoughts are an efflorescence of feeling; the enhancement of a mood or sentiment is their aim; congruity of emotion, their binding tie.

3. In its next sense, thought denotes belief resting upon some basis, that is, real or supposed knowledge going beyond what is directly present. It is marked by *acceptance or rejection of something as reasonably probable or improbable*. This phase of thought, however, includes two such distinct types of belief that, even though their difference is strictly one of degree, not of kind, it becomes practically important to consider them separately. Some beliefs are accepted when their grounds have not themselves been considered, others are accepted because their grounds have been examined.

When we say, "People used to think the world was flat," or, "I thought you went by the house," we express belief: something is accepted, held to, acquiesced in, or affirmed. But such thoughts may mean a supposition accepted without reference to its real grounds. These may be adequate, they may not; but their value with reference to the support they afford the belief has not been considered.

Such thoughts grow up unconsciously and without reference to the attainment of correct belief. They are picked up—we know not how. From obscure sources and by unnoticed channels they insinuate themselves into acceptance and become unconsciously a part of our mental furniture. Tradition, instruction, imitation—all of which depend upon authority in some form, or appeal to our own advantage, or fall in with a strong passion—are responsible for them. Such thoughts are prejudices, that is, prejudgments, not judgments proper that rest upon a survey of evidence.¹

4. Thoughts that result in belief have an importance attached to them which leads to reflective thought, to conscious inquiry into the nature, conditions, and bearings of the belief. To *think* of whales and camels in the clouds is to entertain ourselves with fancies, terminable at our pleasure, which do not lead to any belief in particular. But to think of the world as flat is to ascribe a quality to a real thing as its real property. This conclusion denotes a connection among things and hence is not, like imaginative thought, plastic to our mood. Belief in the world's flatness commits him who holds it to thinking in certain specific ways of other objects, such as the heavenly bodies, antipodes, the possibility of navigation. It prescribes to him actions in accordance with his conception of these objects.

The consequences of a belief upon other beliefs and upon behavior may be so important, then, that men are forced to consider the grounds or reasons of their belief and its logical consequences. This means reflective thought—thought in its eulogistic and emphatic sense.

People *thought* the world was flat until Columbus *thought* it to be round. The earlier thought was a belief held because people had not the energy or the courage to question what those about them accepted and taught, especially as it was suggested and seemingly confirmed by obvious sensible facts. The thought of Columbus was a *reasoned conclusion*. It marked the close of study into facts, of scrutiny and revision of evidence, of working out the implications of various hypotheses, and of comparing these theoretical results with one another and with known facts. Because Columbus did not accept unhesitatingly the current traditional theory, because he doubted and inquired, he arrived at his thought. Skeptical of what, from long habit, seemed most certain, and credulous of what seemed impossible, he went on thinking until he could produce evidence for both his confidence and his disbelief. Even if his conclusion had finally turned out

wrong, it would have been a different sort of belief from those it antagonized, because it was reached by a different method. *Active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it, and the further conclusions to which it tends*, constitutes reflective thought. Any one of the first three kinds of thought may elicit this type; but once begun, it is a conscious and voluntary effort to establish belief upon a firm basis of reasons.

§2. *The Central Factor in Thinking*

There are, however, no sharp lines of demarcation between the various operations just outlined. The problem of attaining correct habits of reflection would be much easier than it is, did not the different modes of thinking blend insensibly into one another. So far, we have considered rather extreme instances of each kind in order to get the field clearly before us. Let us now reverse this operation; let us consider a rudimentary case of thinking, lying between careful examination of evidence and a mere irresponsible stream of fancies. A man is walking on a warm day. The sky was clear the last time he observed it; but presently he notes, while occupied primarily with other things, that the air is cooler. It occurs to him that it is probably going to rain; looking up, he sees a dark cloud between him and the sun, and he then quickens his steps. What, if anything, in such a situation can be called thought? Neither the act of walking nor the noting of the cold is a thought. Walking is one direction of activity; looking and noting are other modes of activity. The likelihood that it will rain is, however, something *suggested*. The pedestrian *feels* the cold; he *thinks* of clouds and a coming shower.

So far there is the same sort of situation as when one looking at a cloud is reminded of a human figure and face. Thinking in both of these cases (the cases of belief and of fancy) involves a noted or perceived fact, followed by something else which is not observed but which is brought to mind, suggested by the thing seen. One reminds us, as we say, of the other. Side by side, however, with this factor of agreement in the two cases of suggestion is a factor of marked disagreement. We do not *believe* in the face suggested by the cloud; we do not consider at all the probability of its being a fact. There is no *reflective* thought. The danger of rain, on the contrary, presents itself to us as a genuine possibility—as a possible fact of the same nature as the observed coolness. Put differently, we do not regard the cloud as meaning or indicating a face, but merely as suggesting it, while we do consider that the coolness may mean rain. In the first case, seeing an object, we just happen, as we say, to think of something else; in the second, we consider the *possibility and nature of the connection between the object seen and the object suggested*. The seen thing is regarded as in

some way *the ground or basis of belief* in the suggested thing; it possesses the quality of *evidence*.

This function by which one thing signifies or indicates another, and thereby leads us to consider how far one may be regarded as warrant for belief in the other, is, then, the central factor in all reflective or distinctively intellectual thinking. By calling up various situations to which such terms as *signifies* and *indicates* apply, the student will best realize for himself the actual facts denoted by the words *reflective thought*. Synonyms for these terms are: points to, tells of, betokens, prognosticates, represents, stands for, implies.² We also say one thing portends another; is ominous of another, or a symptom of it, or a key to it, or (if the connection is quite obscure) that it gives a hint, clue, or intimation.

Reflection thus implies that something is believed in (or disbelieved in), not on its own direct account, but through something else which stands as witness, evidence, proof, voucher, warrant; that is, as *ground of belief*. At one time, rain is actually felt or directly experienced; at another time, we infer that it has rained from the looks of the grass and trees, or that it is going to rain because of the condition of the air or the state of the barometer. At one time, we see a man (or suppose we do) without any intermediary fact; at another time, we are not quite sure what we see, and hunt for accompanying facts that will serve as signs, indications, tokens of what is to be believed.

Thinking, for the purposes of this inquiry, is defined accordingly as *that operation in which present facts suggest other facts (or truths) in such a way as to induce belief in the latter upon the ground or warrant of the former*. We do not put beliefs that rest simply on inference on the surest level of assurance. To say "I think so" implies that I do not as yet *know so*. The inferential belief may later be confirmed and come to stand as sure, but in itself it always has a certain element of supposition.

§3. *Elements in Reflective Thinking*

So much for the description of the more external and obvious aspects of the fact called *thinking*. Further consideration at once reveals certain subprocesses which are involved in every reflective operation. These are: (a) a state of perplexity, hesitation, doubt; and (b) an act of search or investigation directed toward bringing to light further facts which serve to corroborate or to nullify the suggested belief.

A. In our illustration, the shock of coolness generated confusion and suspended belief, at least momentarily. Because it was unexpected, it was a shock or an interruption needing to be accounted for, identified, or placed. To say that the abrupt occurrence of the change of temperature constitutes a problem may sound forced and artificial; but if we are willing to

extend the meaning of the word *problem* to whatever—no matter how slight and commonplace in character—perplexes and challenges the mind so that it makes belief at all uncertain, there is a genuine problem or question involved in this experience of sudden change.

B. The turning of the head, the lifting of the eyes, the scanning of the heavens, are activities adapted to bring to recognition facts that will answer the question presented by the sudden coolness. The facts as they first presented themselves were perplexing; they suggested, however, clouds. The act of looking was an act to discover if this suggested explanation held good. It may again seem forced to speak of this looking, almost automatic, as an act of research or inquiry. But once more, if we are willing to generalize our conceptions of our mental operations to include the trivial and ordinary as well as the technical and recondite, there is no good reason for refusing to give such a title to the act of looking. The purport of this act of inquiry is to confirm or to refute the suggested belief. New facts are brought to perception, which either corroborate the idea that a change of weather is imminent, or negate it.

Another instance, commonplace also, yet not quite so trivial, may enforce this lesson. A man traveling in an unfamiliar region comes to a branching of the roads. Having no sure knowledge to fall back upon, he is brought to a standstill of hesitation and suspense. Which road is right? And how shall perplexity be resolved? There are but two alternatives: he must either blindly and arbitrarily take his course, trusting to luck for the outcome, or he must discover grounds for the conclusion that a given road is right. Any attempt to decide the matter by thinking will involve inquiry into other facts, whether brought out by memory or by further observation, or by both. The perplexed wayfarer must carefully scrutinize what is before him and he must cudgel his memory. He looks for evidence that will support belief in favor of either of the roads—for evidence that will weight down one suggestion. He may climb a tree; he may go first in this direction, then in that, looking, in either case, for signs, clues, indications. He wants something in the nature of a signboard or a map, and *his reflection is aimed at the discovery of facts that will serve this purpose*.

The above illustration may be generalized. Thinking begins in what may fairly enough be called a *forked road* situation, a situation which is ambiguous, which presents a dilemma, which proposes alternatives. As long as our activity glides smoothly along from one thing to another, or as long as we permit our imagination to entertain fancies at pleasure, there is no call for reflection. Difficulty or obstruction in the way of reaching a belief brings us, however, to a pause. In the suspense of uncertainty, we metaphorically climb a tree; we try to find some standpoint from which we may survey additional

facts and, getting a more commanding view of the situation, may decide how the facts stand related to one another.

Demand for the solution of a perplexity is the steadying and guiding factor in the entire process of reflection.

Where there is no question of a problem to be solved or a difficulty to be surmounted, the course of suggestions flows on at random; we have the first type of thought described. If the stream of suggestions is controlled simply by their emotional congruity, their fitting agreeably into a single picture or story, we have the second type. But a question to be answered, an ambiguity to be resolved, sets up an end and holds the current of ideas to a definite channel. Every suggested conclusion is tested by its reference to this regulating end, by its pertinence to the problem in hand. This need of straightening out a perplexity also controls the kind of inquiry undertaken. A traveler whose end is the most beautiful path will look for other considerations and will test suggestions occurring to him on another principle than if he wishes to discover the way to a given city. *The problem fixes the end of thought and the end controls the process of thinking.*

§4. Summary

We may recapitulate by saying that the origin of thinking is some perplexity, confusion, or doubt. Thinking is not a case of spontaneous combustion; it does not occur just on "general principles." There is something specific which occasions and evokes it. General appeals to a child (or to a grown-up) to think, irrespective of the existence in his own experience of some difficulty that troubles him and disturbs his equilibrium, are as futile as advice to lift himself by his boot-straps.

Given a difficulty, the next step is suggestion of some way out—the formation of some tentative plan or project, the entertaining of some theory which will account for the peculiarities in question, the consideration of some solution for the problem. The data at hand cannot supply the solution; they can only suggest it. What, then, are the sources of the suggestion? Clearly past experience and prior knowledge. If the person has had some acquaintance with similar situations, if he has dealt with material of the same sort before, suggestions more or less apt and helpful are likely to arise. But unless there has been experience in some degree analogous, which may now be represented in imagination, confusion remains mere confusion. There is nothing upon which to draw in order to clarify it. Even when a child (or a grown-up) has a problem, to urge him to think when he has no prior experiences involving some of the same conditions, is wholly futile.

If the suggestion that occurs is at once accepted, we have uncritical thinking, the minimum of reflection. To turn the thing over in mind, to reflect, means to hunt for additional

evidence, for new data, that will develop the suggestion, and will either, as we say, bear it out or else make obvious its absurdity and irrelevance. Given a genuine difficulty and a reasonable amount of analogous experience to draw upon, the difference, *par excellence*, between good and bad thinking is found at this point. The easiest way is to accept any suggestion that seems plausible and thereby bring to an end the condition of mental uneasiness. Reflective thinking is always more or less troublesome because it involves overcoming the inertia that inclines one to accept suggestions at their face value; it involves willingness to endure a condition of mental unrest and disturbance. Reflective thinking, in short, means judgment suspended during further inquiry; and suspense is likely to be somewhat painful. As we shall see later, the most important factor in the training of good mental habits consists in acquiring the attitude of suspended conclusion, and in mastering the various methods of searching for new materials to corroborate or to refute the first suggestions that occur. To maintain the state of doubt and to carry on systematic and protracted inquiry—these are the essentials of thinking.

Chapter Two—*The Need for Training Thought*

To expatiate upon the importance of thought would be absurd. The traditional definition of man as "the thinking animal" fixes thought as the essential difference between man and the brutes—surely an important matter. More relevant to our purpose is the question *how* thought is important, for an answer to this question will throw light upon the kind of training thought requires if it is to subserve its end.

§1. *The Values of Thought*

1. Thought affords the sole method of escape from purely impulsive or purely routine action. A being without capacity for thought is moved only by instincts and appetites, as these are called forth by outward conditions and by the inner state of the organism. A being thus moved is, as it were, pushed from behind. This is what we mean by the blind nature of brute actions. The agent does not see or foresee the end for which he is acting, nor the results produced by his behaving in one way rather than in another. They do not "know what they are about." Where there is thought, things present act as signs or tokens of things not yet experienced. A thinking being can, accordingly, *act on the basis of the absent and the future*. Instead of being pushed into a mode of action by the sheer urgency of forces, whether instincts or habits, of which he is not aware, a reflective agent is drawn (to some extent at least) to action by some remoter object of which he is indirectly aware.

An animal without thought may go into its hole when rain threatens, because of some immediate stimulus to its organism. A thinking agent will perceive that certain given facts are probable signs of a future rain, and will take steps in the light of this anticipated future. To plant seeds, to cultivate the soil, to harvest grain, are intentional acts, possible only to a being who has learned to subordinate the immediately felt elements of an experience to those values which these hint at and prophesy. Philosophers have made much of the phrases "book of nature," "language of nature." Well, it is in virtue of the capacity of thought that given things are significant of absent things, and that nature speaks a language which may be interpreted. To a being who thinks, things are records of their past, as fossils tell of the prior history of the earth, and are prophetic of their future, as from the present positions of heavenly bodies remote eclipses are foretold. Shakespeare's "tongues in trees, books in the running brooks," expresses literally enough the power superadded to existences when they appeal to a thinking being. Upon the function of signification depend all foresight, all intelligent planning, deliberation, and calculation.

2. By thought we also develop and arrange artificial signs to remind us in advance of consequences, and of ways of securing and avoiding them. As the trait just mentioned makes the difference between savage and brute, so this trait makes the difference between civilized and savage. A savage who has been shipwrecked in a river may note certain things which serve [them] as signs of danger in the future. But the civilized deliberately *make* such signs; they set up in advance of wreckage warning buoys, and build lighthouses where they see signs that such events may occur. A savage reads weather signs with great expertness; the civilized institute a weather service by which signs are artificially secured and information is distributed in advance of the appearance of any signs that could be detected without special methods. A savage finds his way skillfully through a wilderness by reading certain obscure indications; the civilized build a highway which shows the road to all. The savage learns to detect the signs of fire and thereby to invent methods of producing flame; the civilized invent permanent conditions for producing light and heat whenever they are needed. The very essence of civilized culture is that we deliberately erect monuments and memorials, lest we forget; and deliberately institute, in advance of the happening of various contingencies and emergencies of life, devices for detecting their approach and registering their nature, for warding off what is unfavorable, or at least for protecting ourselves from its full impact and for making more secure and extensive what is favorable. All forms of artificial apparatus are intentionally designed modifications of natural things in order that they may serve better than in their natural estate to indicate the hidden, the absent, and the remote.

3. Finally, thought confers upon physical events and objects a very different status and value from that which they possess to a being that does not reflect. These words are mere scratches, curious variations of light and shade, to one to whom they are not linguistic signs. To one for whom they are signs of other things, each has a definite individuality of its own, according to the meaning that it is used to convey. *Exactly the same holds of natural objects.* A chair is a different object to a being to whom it consciously suggests an opportunity for sitting down, repose, or sociable converse, from what it is to one to whom it presents itself merely as a thing to be smelled, or gnawed, or jumped over; a stone is different to one who knows something of its past history and its future use from what it is to one who only feels it directly through his senses. It is only by courtesy, indeed, that we can say that an unthinking animal experiences an *object* at all—so largely is anything that presents itself to us as an object made up by the qualities it possesses as a sign of other things.

An English logician (Mr. Venn) has remarked that it may be questioned whether a dog *sees* a rainbow any more than it apprehends the political constitution of the country in which he lives. The same principle applies to the kennel in which it sleeps and the meat that it eats. When it is sleepy, it goes to the kennel; when it is hungry, it is excited by the smell and color of meat; beyond this, in what sense does it see an *object*? Certainly it does not see a house—i.e. a thing with all the properties and relations of a permanent residence, *unless* it is capable of making what is present a uniform sign of what is absent—unless it is capable of thought. Nor does it see what it eats as meat unless it suggests the absent properties by virtue of which it is a certain joint of some animal, and is known to afford nourishment. Just what is left of an *object* stripped of all such qualities of meaning, we cannot well say; but we can be sure that the object is then a very different sort of thing from the objects that we perceive. There is moreover no particular limit to the possibilities of growth in the fusion of a thing as it is to sense and as it is to thought, or as a sign of other things. The child today soon regards as constituent parts of objects qualities that once it required the intelligence of a Copernicus or a Newton to apprehend.

These various values of the power of thought may be summed up in the following quotation from John Stuart Mill. "To draw inferences," he says, "has been said to be the great business of life. Every one has daily, hourly, and momentary need of ascertaining facts which we have [he has] not directly observed: not from any general purpose of adding to our [his] stock of knowledge, but because the facts themselves are of importance to our [his] interests or to his occupations. The business of the magistrate, of the military commander, of the navigator, of the physician, of the agriculturist, is merely to judge of evidence and to act accordingly. ... As they do this well or ill, so they

discharge well or ill the duties of their several callings. It is the only occupation in which the mind never ceases to be engaged."³

§2. *Importance of Direction in order to Realize these Values*

What a person has not only daily and hourly, but momentary need of performing, is not a technical and abstruse matter; nor, on the other hand, is it trivial and negligible. Such a function must be congenial to the mind, and must be performed, in an unspoiled mind, upon every fitting occasion. Just because, however, it is an operation of drawing inferences, of basing conclusions upon evidence, of reaching belief *indirectly*, it is an operation that may go wrong as well as right, and hence is one that needs safeguarding and training. The greater its importance, the greater are the evils when it is ill-exercised.

An earlier writer than Mill, John Locke (1632-1704), brings out the importance of thought for life and the need of training so that its best and not its worst possibilities will be realized, in the following words: "No one ever sets themselves about anything but upon some view or other, which serves them for a reason for what they do; and whatsoever faculties they employs, the understanding with such light as it has, well or ill informed, constantly leads; and by that light, true or false, all their operative powers are directed. . . . Temples have their sacred images, and we see what influence they have always had over a great part of humankind. But in truth the ideas and images in human minds are the invisible powers that constantly govern them, and to these they all, universally, pay a ready submission. It is therefore of the highest concernment that great care should be taken of the understanding, to conduct it aright in the search of knowledge and in the judgments it makes."⁴ If upon thought hang all deliberate activities and the uses we make of all our other powers, Locke's assertion that it is of the highest concernment that care should be taken of its conduct is a moderate statement. While the power of thought frees us from servile subjection to instinct, appetite, and routine, it also brings with it the occasion and possibility of error and mistake. In elevating us above the brute, it opens to us the possibility of failures to which the animal, limited to instinct, cannot sink.

§3. *Tendencies Needing Constant Regulation*

Up to a certain point, the ordinary conditions of life, natural and social, provide the conditions requisite for regulating the operations of inference. The necessities of life enforce a fundamental and persistent discipline for which the most cunningly devised artifices would be ineffective substitutes. The burnt child dreads the fire; the

painful consequence emphasizes the need of correct inference much more than would learned discourse on the properties of heat. Social conditions also put a premium on correct inferring in matters where action based on valid thought is socially important. These sanctions of proper thinking may affect life itself, or at least a life reasonably free from perpetual discomfort. The signs of enemies, of shelter, of food, of the main social conditions, have to be correctly apprehended.

But this disciplinary training, efficacious as it is within certain limits, does not carry us beyond a restricted boundary. Logical attainment in one direction is no bar to extravagant conclusions in another. A savage expert in judging signs of the movements and location of animals that they hunt, will accept and gravely narrate the most preposterous yarns concerning the origin of their habits and structures. When there is no directly appreciable reaction of the inference upon the security and prosperity of life, there are no natural checks to the acceptance of wrong beliefs. Conclusions may be generated by a modicum of fact merely because the suggestions are vivid and interesting; a large accumulation of data may fail to suggest a proper conclusion because existing customs are averse to entertaining it. Independent of training, there is a "primitive credulity" which tends to make no distinction between what a trained mind calls fancy and that which it calls a reasonable conclusion. The face in the clouds is believed in as some sort of fact, merely because it is forcibly suggested. Natural intelligence is no barrier to the propagation of error, nor large but untrained experience to the accumulation of fixed false beliefs. Errors may support one another mutually and weave an ever larger and firmer fabric of misconception. Dreams, the positions of stars, the lines of the hand, may be regarded as valuable signs, and the fall of cards as an inevitable omen, while natural events of the most crucial significance go disregarded. Beliefs in portents of various kinds, now mere nook and cranny superstitions, were once universal. A long discipline in exact science was required for their conquest.

In the mere function of suggestion, there is no difference between the power of a column of mercury to portend rain, and that of the entrails of an animal or the flight of birds to foretell the fortunes of war. For all anybody can tell in advance, the spilling of salt is as likely to import bad luck as the bite of a mosquito to import malaria. Only systematic regulation of the conditions under which observations are made and severe discipline of the habits of entertaining suggestions can secure a decision that one type of belief is vicious and the other sound. The substitution of scientific for superstitious habits of inference has not been brought about by any improvement in the acuteness of the senses or in the natural workings of the function of suggestion. It is the result of regulation of the conditions under which observation and inference take place.

It is instructive to note some of the attempts that have been made to classify the main sources of error in reaching beliefs. Francis Bacon, for example, at the beginnings of modern scientific inquiry, enumerated four such classes, under the somewhat fantastic title of "idols" (Gr. εἰδωλα, images), spectral forms that allure the mind into false paths. These he called the idols, or phantoms, of the (a) tribe, (b) the market-place, (c) the cave or den, and (d) the theater; or, less metaphorically, (a) standing erroneous methods (or at least temptations to error) that have their roots in human nature generally; (b) those that come from intercourse and language; (c) those that are due to causes peculiar to a specific individual; and finally, (d) those that have their sources in the fashion or general current of a period. Classifying these causes of fallacious belief somewhat differently, we may say that two are intrinsic and two are extrinsic. Of the intrinsic, one is common to all men alike (such as the universal tendency to notice instances that corroborate a favorite belief more readily than those that contradict it), while the other resides in the specific temperament and habits of the given individual. Of the extrinsic, one proceeds from generic social conditions—like the tendency to suppose that there is a fact wherever there is a word, and no fact where there is no linguistic term—while the other proceeds from local and temporary social currents.

Locke's method of dealing with typical forms of wrong belief is less formal and may be more enlightening. We can hardly do better than quote his forcible and quaint language, when, enumerating different classes of men, he shows different ways in which thought goes wrong:

1. "The first is of those who seldom reason at all, but do and think according to the example of others, whether parents, neighbors, ministers, or who else they are pleased to make choice of to have an implicit faith in, for the saving of themselves the pains and troubles of thinking and examining for themselves."
2. "This kind is of those who put passion in the place of reason, and being resolved that shall govern their actions and arguments, neither use their own, nor hearken to other people's reason, any farther than it suits their humor, interest, or party."⁵
3. "The third sort is of those who readily and sincerely follow reason, but for want of having that which one may call large, sound, roundabout sense, have not a full view of all that relates to the question. ... They converse but with one sort of people, they read but one sort of books, they will not come in the hearing but of one sort of notions. ... They have a pretty traffic with known correspondents in some little creek ... but will not venture out into the great ocean of knowledge." People of originally equal natural parts may finally arrive at very different stores of knowledge and truth, "when all the odds between them has been the different scope that has

been given to their understandings to range in, for the gathering up of information and furnishing their heads with ideas and notions and observations, whereon to employ their mind."⁶

In another portion of his writings,⁷ Locke states the same ideas in slightly different form.

1. "That which is inconsistent with our *principles* is so far from passing for probable with us that it will not be allowed possible. The reverence borne to these principles is so great, and their authority so paramount to all other, that the testimony, not only of other men, but the evidence of our own senses are often rejected, when they offer to vouch anything contrary to these established rules. ... There is nothing more ordinary than children's receiving into their minds propositions ... from their parents, nurses, or those about them; which being insinuated in their unwary as well as unbiased understandings, and fastened by degrees, are at last (and this whether true or false) riveted there by long custom and education, beyond all possibility of being pulled out again. For adults, when they are grown up, reflecting upon their opinions and finding those of this sort to be as ancient in their minds as their very memories, not having observed their early insinuation, nor by what means they got them, they are apt to reverence them as sacred things, and not to suffer them to be profaned, touched, or questioned." They take them as standards "to be the great and unerring deciders of truth and falsehood, and the judges to which they are to appeal in all manner of controversies."
2. "Secondly, next to these are people[men] whose understandings are cast into a mold, and fashioned just to the size of a received hypothesis." Such people, Locke goes on to say, while not denying the existence of facts and evidence, cannot be convinced by the evidence that would decide them if their minds were not so closed by adherence to fixed belief.
3. "Predominant Passions. Thirdly, probabilities which cross people's appetites and prevailing passions run the same fate. Let ever so much probability hang on one side of a covetous person's reasoning, and money on the other, it is easy to foresee which will outweigh. Earthly minds, like mud walls, resist the strongest batteries.
4. "Authority. The fourth and last wrong measure of probability I shall take notice of, and which keeps in ignorance or error more people than all the others together, is the giving up our assent to the common received opinions, either of our friends or party, neighborhood or country."

Both Bacon and Locke make it evident that over and above the sources of misbelief that reside in the natural tendencies of the individual (like those toward hasty and

too far-reaching conclusions), social conditions tend to instigate and confirm wrong habits of thinking by authority, by conscious instruction, and by the even more insidious half-conscious influences of language, imitation, sympathy, and suggestion. Education has accordingly not only to safeguard an individual against the besetting erroneous tendencies of his own mind—its rashness, presumption, and preference of what chimes with self-interest to objective evidence—but also to undermine and destroy the accumulated and self-perpetuating prejudices of long ages. When social life in general has become more reasonable, more imbued with rational conviction, and less moved by stiff authority and blind passion, educational agencies may be more positive and constructive than at present, for they will work in harmony with the educative influence exercised willy-nilly by other social surroundings upon an individual's habits of thought and belief. At present, the work of teaching must not only transform natural tendencies into trained habits of thought, but must also fortify the mind against irrational tendencies current in the social environment, and help displace erroneous habits already produced.

§4. *Regulation Transforms Inference into Proof*

Thinking is important because, as we have seen, it is that function in which given or ascertained facts stand for or indicate others which are not directly ascertained. But the process of reaching the absent from the present is peculiarly exposed to error; it is liable to be influenced by almost any number of unseen and unconsidered causes—past experience, received dogmas, the stirring of self-interest, the arousing of passion, sheer mental laziness, a social environment steeped in biased traditions or animated by false expectations, and so on. The exercise of thought is, in the literal sense of that word, inference; by it one thing carries us over to the idea of, and belief in, another thing. It involves a jump, a leap, a going beyond what is surely known to something else accepted on its warrant. Unless one is an idiot, one simply cannot help having all things and events suggest other things not actually present, nor can one help a tendency to believe in the latter on the basis of the former. The very inevitableness of the jump, the leap, to something unknown, only emphasizes the necessity of attention to the conditions under which it occurs so that the danger of a false step may be lessened and the probability of a right landing increased.

Such attention consists in regulation (1) of the conditions under which the function of suggestion takes place, and (2) of the conditions under which credence is yielded to the suggestions that occur. Inference controlled in these two ways (the study of which in detail constitutes one of the chief objects of this book) forms *proof*. To prove a thing means primarily to try, to test it. The guest bidden to

the wedding feast excused themselves because they had to *prove* their oxen. Exceptions are said to prove a rule; i.e. they furnish instances so extreme that they try in the severest fashion its applicability; if the rule will stand such a test, there is no good reason for further doubting it. Not until a thing has been tried—"tried out," in colloquial language—do we know its true worth. Till then it may be pretense, a bluff. But the thing that has come out victorious in a test or trial of strength carries its credentials with it; it is approved, because it has been proved. Its value is clearly evinced, shown, i.e. demonstrated. So it is with inferences. The mere fact that inference in general is an invaluable function does not guarantee, nor does it even help out the correctness of any particular inference. Any inference may go astray; and as we have seen, there are standing influences ever ready to assist its going wrong. *What is important, is that every inference shall be a tested inference; or (since often this is not possible) that we shall discriminate between beliefs that rest upon tested evidence and those that do not, and shall be accordingly on our guard as to the kind and degree of assent yielded.*

While it is not the business of education to prove every statement made, any more than to teach every possible item of information, it is its business to cultivate deep-seated and effective habits of discriminating tested beliefs from mere assertions, guesses, and opinions; to develop a lively, sincere, and open-minded preference for conclusions that are properly grounded, and to ingrain into the individual's working habits methods of inquiry and reasoning appropriate to the various problems that present themselves. No matter how much an individual knows as a matter of hearsay and information, if he has not attitudes and habits of this sort, he is not intellectually educated. He lacks the rudiments of mental discipline. And since these habits are not a gift of nature (no matter how strong the aptitude for acquiring them); since, moreover, the casual circumstances of the natural and social environment are not enough to compel their acquisition, the main office of education is to supply conditions that make for their cultivation. The formation of these habits is the Training of Mind.

Chapter Three—Natural Resources in the Training of Thought

In the last chapter we considered the need of transforming, through training, the natural capacities of inference into habits of critical examination and inquiry. The very importance of thought for life makes necessary its control by education because of its natural tendency to go astray, and because social influences exist that tend to form habits of thought leading to inadequate and erroneous beliefs. Training must, however, be itself based upon the natural tendencies—that is, it must find its point of departure in them. A being who could not think without training could never be trained to think; one may

have to learn to think *well*, but not to *think*. Training, in short, must fall back upon the prior and independent existence of natural powers; it is concerned with their proper direction, not with creating them.

Teaching and learning are correlative or corresponding processes, as much so as selling and buying. One might as well say he has sold when no one has bought, as to say that he has taught when no one has learned. And in the educational transaction, the initiative lies with the learner even more than in commerce it lies with the buyer. If an individual can learn to think only in the sense of learning to employ more economically and effectively powers he already possesses, even more truly one can teach others to think only in the sense of appealing to and fostering powers already active in them. Effective appeal of this kind is impossible unless the teacher has an insight into existing habits and tendencies, the natural resources with which he has to ally himself.

Any inventory of the items of this natural capital is somewhat arbitrary because it must pass over many of the complex details. But a statement of the factors essential to thought will put before us in outline the main elements. Thinking involves (as we have seen) the suggestion of a conclusion for acceptance, and also search or inquiry to test the value of the suggestion before finally accepting it. This implies (a) a certain fund or store of experiences and facts from which suggestions proceed; (b) promptness, flexibility, and fertility of suggestions; and (c) orderliness, consecutiveness, appropriateness in what is suggested. Clearly, a person may be hampered in any of these three regards: His thinking may be irrelevant, narrow, or crude because he has not enough actual material upon which to base conclusions; or because concrete facts and raw material, even if extensive and bulky, fail to evoke suggestions easily and richly; or finally, because, even when these two conditions are fulfilled, the ideas suggested are incoherent and fantastic, rather than pertinent and consistent.

§1. *Curiosity*

The most vital and significant factor in supplying the primary material whence suggestion may issue is, without doubt, curiosity. The wisest of the Greeks used to say that wonder is the mother of all science. An inert mind waits, as it were, for experiences to be imperiously forced upon it. The pregnant saying of Wordsworth:

"The eye—it cannot choose but see;
We cannot bid the ear be still;
Our bodies feel, where'er they be,
Against or with our will"—

holds good in the degree in which one is naturally possessed by curiosity. The curious mind is constantly alert and exploring, seeking material for thought, as a vigorous and healthy body is on the *qui vive* for

nutriment. Eagerness for experience, for new and varied contacts, is found where wonder is found. Such curiosity is the only sure guarantee of the acquisition of the primary facts upon which inference must base itself.

(a) In its first manifestations, curiosity is a vital overflow, an expression of an abundant organic energy. A physiological uneasiness leads a child to be "into everything,"—to be reaching, poking, pounding, prying. Observers of animals have noted what one author calls "their inveterate tendency to fool." "Rats run about, smell, dig, or gnaw, without real reference to the business in hand. In the same way Jack [a dog] scrabbles and jumps, the kitten wanders and picks, the otter slips about everywhere like ground lightning, the elephant fumbles ceaselessly, the monkey pulls things about."⁸ The most casual notice of the activities of a young child reveals a ceaseless display of exploring and testing activity. Objects are sucked, fingered, and thumped; drawn and pushed, handled and thrown; in short, experimented with, till they cease to yield new qualities. Such activities are hardly intellectual, and yet without them intellectual activity would be feeble and intermittent through lack of stuff for its operations.

(b) A higher stage of curiosity develops under the influence of social stimuli. When the child learns that he can appeal to others to eke out his store of experiences, so that, if objects fail to respond interestingly to his experiments, he may call upon persons to provide interesting material, a new epoch sets in. "What is that?" "Why?" become the unfailing signs of a child's presence. At first this questioning is hardly more than a projection into social relations of the physical overflow which earlier kept the child pushing and pulling, opening and shutting. He asks in succession what holds up the house, what holds up the soil that holds the house, what holds up the earth that holds the soil; but his questions are not evidence of any genuine consciousness of rational connections. His *why* is not a demand for scientific explanation; the motive behind it is simply eagerness for a larger acquaintance with the mysterious world in which he is placed. The search is not for a law or principle, but only for a bigger fact. Yet there is more than a desire to accumulate just information or heap up disconnected items, although sometimes the interrogating habit threatens to degenerate into a mere disease of language. In the feeling, however dim, that the facts which directly meet the senses are not the whole story, that there is more behind them and more to come from them, lies the germ of *intellectual* curiosity.

(c) Curiosity rises above the organic and the social planes and becomes intellectual in the degree in which it is transformed into interest in *problems* provoked by the observation of things and the accumulation of material. When the question is not discharged by being asked of another, when the child continues to entertain it in his own mind and to be alert for whatever will help answer it, curiosity has become a positive intellectual force. To the

open mind, nature and social experience are full of varied and subtle challenges to look further. If germinating powers are not used and cultivated at the right moment, they tend to be transitory, to die out, or to wane in intensity. This general law is peculiarly true of sensitiveness to what is uncertain and questionable; in a few people, intellectual curiosity is so insatiable that nothing will discourage it, but in most its edge is easily dulled and blunted. Bacon's saying that we must become as little children in order to enter the kingdom of science is at once a reminder of the open-minded and flexible wonder of childhood and of the ease with which this endowment is lost. Some lose it in indifference or carelessness; others in a frivolous flippancy; many escape these evils only to become incased in a hard dogmatism which is equally fatal to the spirit of wonder. Some are so taken up with routine as to be inaccessible to new facts and problems. Others retain curiosity only with reference to what concerns their personal advantage in their chosen career. With many, curiosity is arrested on the plane of interest in local gossip and in the fortunes of their neighbors; indeed, so usual is this result that very often the first association with the word *curiosity* is a prying inquisitiveness into other people's business. With respect then to curiosity, the teacher has usually more to learn than to teach. Rarely can they aspire to the office of kindling or even increasing it. Their task is rather to keep alive the sacred spark of wonder and to fan the flame that already glows. Their problem is to protect the spirit of inquiry, to keep it from becoming blasé from overexcitement, wooden from routine, fossilized through dogmatic instruction, or dissipated by random exercise upon trivial things.

§2. *Suggestion*

Out of the subject-matter, whether rich or scanty, important or trivial, of present experience issue suggestions, ideas, beliefs as to what is not yet given. The function of suggestion is not one that can be produced by teaching; while it may be modified for better or worse by conditions, it cannot be destroyed. Many a child has tried his best to see if he could not "stop thinking," but the flow of suggestions goes on in spite of our will, quite as surely as "our bodies feel, where'er they be, against or with our will." Primarily, naturally, it is not *we* who think, in any actively responsible sense; thinking is rather something that happens in us. Only so far as one has acquired control of the method in which the function of suggestion occurs and has accepted responsibility for its consequences, can one truthfully say, "I think so and so." [...]

§3. *Orderliness: Its Nature*

Facts, whether narrow or extensive, and conclusions suggested by them, whether many or few, do not

constitute, even when combined, reflective thought. The suggestions must be *organized*; they must be arranged with reference to one another and with reference to the facts on which they depend for proof. When the factors of facility, of fertility, and of depth are properly balanced or proportioned, we get as the outcome continuity of thought. We desire neither the slow mind nor yet the hasty. We wish neither random diffuseness nor fixed rigidity. Consecutiveness means flexibility and variety of materials, conjoined with singleness and definiteness of direction. It is opposed both to a mechanical routine uniformity and to a grasshopper-like movement. Of bright children, it is not infrequently said that "they might do anything, if only they settled down," so quick and apt are they in any particular response. But, alas, they rarely settle.

On the other hand, it is not enough *not* to be diverted. A deadly and fanatic consistency is not our goal. Concentration does not mean fixity, nor a cramped arrest or paralysis of the flow of suggestion. It means variety and change of ideas combined into a *single steady trend moving toward a unified conclusion*. Thoughts are concentrated not by being kept still and quiescent, but by being kept moving toward an object, as a general concentrates his troops for attack or defense. Holding the mind to a subject is like holding a ship to its course; it implies constant change of place combined with unity of direction. Consistent and orderly thinking is precisely such a change of subject-matter. Consistency is no more the mere absence of contradiction than concentration is the mere absence of diversion—which exists in dull routine or in a person "fast asleep." All kinds of varied and incompatible suggestions may sprout and be followed in their growth, and yet thinking be consistent and orderly, provided each one of the suggestions is viewed in relation to the main topic. [...]

Chapter Five—*The Means and End of Mental Training: The Psychological and the Logical*

§1. *Introductory: The Meaning of Logical*

In the preceding chapters we have considered (i) what thinking is; (ii) the importance of its special training; (iii) the natural tendencies that lend themselves to its training; and (iv) some of the special obstacles in the way of its training under school conditions. We come now to the relation of *logic* to the purpose of mental training.

In its broadest sense, any thinking that ends in a conclusion is logical—whether the conclusion reached be justified or fallacious; that is, the term *logical* covers both the logically good and the illogical or the logically bad. In its narrowest sense, the term *logical* refers only to what is demonstrated to follow necessarily from premises that are definite in meaning and that are either self-evidently true, or that have been previously proved to be true. Stringency

of proof is here the equivalent of the logical. In this sense mathematics and formal logic (perhaps as a branch of mathematics) alone are strictly logical. Logical, however, is used in a third sense, which is at once more vital and more practical; to denote, namely, the systematic care, negative and positive, taken to safeguard reflection so that it may yield the best results under the given conditions. If only the word *artificial* were associated with the idea of *art*, or expert skill gained through voluntary apprenticeship (instead of suggesting the factitious and unreal), we might say that logical refers to artificial thought.

In this sense, the word *logical* is synonymous with wide-awake, thorough, and careful reflection—thought in its best sense (*ante*, §1, 4). Reflection is turning a topic over in various aspects and in various lights so that nothing significant about it shall be overlooked—almost as one might turn a stone over to see what its hidden side is like or what is covered by it. *Thoughtfulness* means, practically, the same thing as careful attention; to give our mind to a subject is to give heed to it, to take pains with it. In speaking of reflection, we naturally use the words *weigh*, *ponder*, *deliberate*—terms implying a certain delicate and scrupulous balancing of things against one another. Closely related names are *scrutiny*, *examination*, *consideration*, *inspection*—terms which imply close and careful vision. Again, to think is to relate things to one another definitely, to “put two and two together” as we say. Analogy with the accuracy and definiteness of mathematical combinations gives us such expressions as *calculate*, *reckon*, *account for*; and even *reason* itself—ratio. Caution, carefulness, thoroughness, definiteness, exactness, orderliness, methodic arrangement, are, then, the traits by which we mark off the logical from what is random and casual on one side, and from what is academic and formal on the other.

No argument is needed to point out that the educator is concerned with the logical in its practical and vital sense. Argument is perhaps needed to show that the *intellectual* (as distinct from the *moral*) *end of education is entirely and only the logical in this sense; namely, the formation of careful, alert, and thorough habits of thinking*. The chief difficulty in the way of recognition of this principle is a false conception of the relation between the psychological tendencies of an individual and his logical achievements. If it be assumed—as it is so frequently—that these have, intrinsically, nothing to do with each other, then logical training is inevitably regarded as something foreign and extraneous, something to be ingrafted upon the individual from without, so that it is absurd to identify the object of education with the development of logical power.

The conception that the psychology of individuals has no intrinsic connections with logical methods and results is held, curiously enough, by two opposing schools of educational theory. To one school, the *natural*⁹ is primary

and fundamental; and its tendency is to make little of distinctly intellectual nurture. Its mottoes are freedom, self-expression, individuality, spontaneity, play, interest, natural unfolding, and so on. In its emphasis upon individual attitude and activity, it sets slight store upon organized subject-matter, or the material of study, and conceives *method* to consist of various devices for stimulating and evoking, in their natural order of growth, the native potentialities of individuals.

The other school estimates highly the value of the logical, but conceives the natural tendency of individuals to be averse, or at least indifferent, to logical achievement. It relies upon *subject-matter*—upon matter already defined and classified. Method, then, has to do with the devices by which these characteristics may be imported into a mind naturally reluctant and rebellious. Hence its mottoes are discipline, instruction, restraint, voluntary or conscious effort, the necessity of tasks, and so on. From this point of view studies, rather than attitudes and habits, embody the logical factor in education. The mind becomes logical only by learning to conform to an external subject-matter. To produce this conformity, the study should first be analyzed (by text-book or teacher) into its logical elements; then each of these elements should be defined; finally, all of the elements should be arranged in series or classes according to logical formulae or general principles. Then the pupil learns the definitions one by one; and progressively adding one to another builds up the logical system, and thereby is himself gradually imbued, from without, with logical quality.

This description will gain meaning through an illustration. Suppose the subject is geography. The first thing is to give its definition, marking it off from every other subject. Then the various abstract terms upon which depends the scientific development of the science are stated and defined one by one—pole, equator, ecliptic, zone—from the simpler units to the more complex which are formed out of them; then the more concrete elements are taken in similar series: continent, island, coast, promontory, cape, isthmus, peninsula, ocean, lake, coast, gulf, bay, and so on. In acquiring this material, the mind is supposed not only to gain important information, but, by accommodating itself to ready-made logical definitions, generalizations, and classifications, gradually to acquire logical habits.

This type of method has been applied to every subject taught in the schools—reading, writing, music, physics, grammar, arithmetic. Drawing, for example, has been taught on the theory that since all pictorial representation is a matter of combining straight and curved lines, the simplest procedure is to have the pupil acquire the ability first to draw straight lines in various positions (horizontal, perpendicular, diagonals at various angles), then typical curves; and finally, to combine straight and curved lines in various permutations to construct actual pictures. This seemed to give the ideal “logical” method, beginning with

analysis into elements, and then proceeding in regular order to more and more complex syntheses, each element being defined when used, and thereby clearly understood.

Even when this method in its extreme form is not followed, few schools (especially of the middle or upper elementary grades) are free from an exaggerated attention to forms supposedly employed by the pupil if he gets his result logically. It is thought that there are certain steps arranged in a certain order, which express preeminently an understanding of the subject, and the pupil is made to "analyze" his procedure into these steps, *i.e.* to learn a certain routine formula of statement. While this method is usually at its height in grammar and arithmetic, it invades also history and even literature, which are then reduced, under plea of intellectual training, to "outlines," diagrams, and schemes of division and subdivision. In memorizing this simulated cut and dried copy of the logic of an adult, the child generally is induced to stultify his own subtle and vital logical movement. The adoption by teachers of this misconception of logical method has probably done more than anything else to bring pedagogy into disrepute; for to many persons "pedagogy" means precisely a set of mechanical, self-conscious devices for replacing by some cast-iron external scheme the personal mental movement of the individual.

A reaction inevitably occurs from the poor results that accrue from these professedly "logical" methods. Lack of interest in study, habits of inattention and procrastination, positive aversion to intellectual application, dependence upon sheer memorizing and mechanical routine with only a modicum of understanding by the pupil of what he is about, show that the theory of logical definition, division, gradation, and system does not work out practically as it is theoretically supposed to work. The consequent disposition—as in every reaction—is to go to the opposite extreme. The "logical" is thought to be wholly artificial and extraneous; teacher and pupil alike are to turn their backs upon it, and to work toward the expression of existing aptitudes and tastes. Emphasis upon natural tendencies and powers as the only possible starting-point of development is indeed wholesome. But the reaction is false, and hence misleading, in what it ignores and denies: the presence of genuinely intellectual factors in existing powers and interests.

What is conventionally termed logical (namely, the logical from the standpoint of subject-matter) represents in truth the logic of the trained adult mind. Ability to divide a subject, to define its elements, and to group them into classes according to general principles represents logical capacity at its best point reached *after* thorough training. The mind that habitually exhibits skill in divisions, definitions, generalizations, and systematic recapitulations no longer needs training in logical methods. But it is absurd to suppose that a mind which needs training because it cannot perform these operations can begin where the expert mind stops. *The logical from*

the standpoint of subject-matter represents the goal, the last term of training, not the point of departure.

In truth, the mind at every stage of development has its own logic. The error of the notion that by appeal to spontaneous tendencies and by multiplication of materials we may completely dismiss logical considerations, lies in overlooking how large a part curiosity, inference, experimenting, and testing already play in the pupil's life. Therefore it underestimates the *intellectual* factor in the more spontaneous play and work of individuals—the factor that alone is truly educative. Any teacher who is alive to the modes of thought naturally operative in the experience of the normal child will have no difficulty in avoiding the identification of the logical with a readymade organization of subject-matter, as well as the notion that the only way to escape this error is to pay no attention to logical considerations. Such a teacher will have no difficulty in seeing that the real problem of intellectual education is the transformation of natural powers into expert, tested powers: the transformation of more or less casual curiosity and sporadic suggestion into attitudes of alert, cautious, and thorough inquiry. He will see that the *psychological* and the *logical*, instead of being opposed to each other (or even independent of each other), are connected *as the earlier and the later stages in one continuous process of normal growth*. The natural or psychological activities, even when not consciously controlled by logical considerations, have their own intellectual function and integrity; conscious and deliberate skill in thinking, when it is achieved, makes habitual or second nature. The first is already logical in spirit; the last, in presenting an ingrained disposition and attitude, is then as *psychological* (as personal) as any caprice or chance impulse could be.

§2. *Discipline and Freedom*

Discipline of mind is thus, in truth, a result rather than a cause. Any mind is disciplined in a subject in which independent intellectual initiative and control have been achieved. Discipline represents original native endowment turned, through gradual exercise, into effective power. So far as a mind is disciplined, control of method in a given subject has been attained so that the mind is able to manage itself independently without external tutelage. The aim of education is precisely to develop intelligence of this independent and effective type—a *disciplined mind*. Discipline is positive and constructive.

Discipline, however, is frequently regarded as something negative—as a painfully disagreeable forcing of mind away from channels congenial to it into channels of constraint, a process grievous at the time but necessary as preparation for a more or less remote future. Discipline is then generally identified with drill; and drill is conceived after the mechanical analogy of driving, by unremitting

blows, a foreign substance into a resistant material; or is imaged after the analogy of the mechanical routine by which raw recruits are trained to a soldierly bearing and habits that are naturally wholly foreign to their possessors. Training of this latter sort, whether it be called discipline or not, is not mental discipline. Its aim and result are not *habits of thinking*, but uniform *external modes of action*. By failing to ask what he means by discipline, many a teacher is misled into supposing that he is developing mental force and efficiency by methods which in fact restrict and deaden intellectual activity, and which tend to create mechanical routine, or mental passivity and servility.

When discipline is conceived in intellectual terms (as the habitual power of effective mental attack), it is identified with freedom in its true sense. For freedom of mind means mental power capable of independent exercise, emancipated from the leading strings of others, not mere unhindered external operation. When spontaneity or naturalness is identified with more or less casual discharge of transitory impulses, the tendency of the educator is to supply a multitude of stimuli in order that spontaneous activity may be kept up. All sorts of interesting materials, equipments, tools, modes of activity, are provided in order that there may be no flagging of free self-expression. This method overlooks some of the essential conditions of the attainment of genuine freedom.

(a) Direct immediate discharge or expression of an impulsive tendency is fatal to thinking. Only when the impulse is to some extent checked and thrown back upon itself does reflection ensue. It is, indeed, a stupid error to suppose that arbitrary tasks must be imposed from without in order to furnish the factor of perplexity and difficulty which is the necessary cue to thought. Every vital activity of any depth and range inevitably meets obstacles in the course of its effort to realize itself—a fact that renders the search for artificial or external problems quite superfluous. The difficulties that present themselves within the development of an experience are, however, to be cherished by the educator, not minimized, for they are the natural stimuli to reflective inquiry. Freedom does not consist in keeping up uninterrupted and unimpeded external activity, but is something achieved through conquering, by personal reflection, a way out of the difficulties that prevent an immediate overflow and a spontaneous success.

(b) The method that emphasizes the psychological and natural, but yet fails to see what an important part of the natural tendencies is constituted at every period of growth by curiosity, inference, and the desire to test, cannot secure a *natural development*. In natural growth each successive stage of activity prepares unconsciously, but thoroughly, the conditions for the manifestation of the next stage—as in the cycle of a plant's growth. There is no ground for assuming that "thinking" is a special, isolated natural tendency that will bloom inevitably in due

season simply because various sense and motor activities have been freely manifested before; or because observation, memory, imagination, and manual skill have been previously exercised without thought. Only when thinking is constantly employed in using the senses and muscles for the guidance and application of observations and movements, is the way prepared for subsequent higher types of thinking.

At present, the notion is current that childhood is almost entirely unreflective—a period of mere sensory, motor, and memory development, while adolescence suddenly brings the manifestation of thought and reason.

Adolescence is not, however, a synonym for magic. Doubtless youth should bring with it an enlargement of the horizon of childhood, a susceptibility to larger concerns and issues, a more generous and a more general standpoint toward nature and social life. This development affords an opportunity for thinking of a more comprehensive and abstract type than has previously obtained. But thinking itself remains just what it has been all the time: a matter of following up and testing the conclusions suggested by the facts and events of life. Thinking begins as soon as the baby who has lost the ball that he is playing with begins to foresee the possibility of something not yet existing—its recovery; and begins to forecast steps toward the realization of this possibility, and, by experimentation, to guide his acts by his ideas and thereby also test the ideas. Only by making the most of the thought-factor, already active in the experiences of childhood, is there any promise or warrant for the emergence of superior reflective power at adolescence, or at any later period.

(c) In any case *positive habits are being formed*: if not habits of careful looking into things, then habits of hasty, heedless, impatient glancing over the surface; if not habits of consecutively following up the suggestions that occur, then habits of haphazard, grasshopper-like guessing; if not habits of suspending judgment till inferences have been tested by the examination of evidence, then habits of credulity alternating with flippant incredulity, belief or unbelief being based, in either case, upon whim, emotion, or accidental circumstances. The only way to achieve traits of carefulness, thoroughness, and continuity (traits that are, as we have seen, the elements of the "logical") is by exercising these traits from the beginning, and by seeing to it that conditions call for their exercise.

Genuine freedom, in short, is intellectual; it rests in the trained *power of thought*, in ability to "turn things over," to look at matters deliberately, to judge whether the amount and kind of evidence requisite for decision is at hand, and if not, to tell where and how to seek such evidence. If a person's actions are not guided by thoughtful conclusions, then they are guided by inconsiderate impulse, unbalanced appetite, caprice, or the circumstances of the moment. To cultivate

unhindered, unreflective external activity is to foster enslavement, for it leaves the person at the mercy of appetite, sense, and circumstance.

¹ This mode of thinking in its contrast with thoughtful inquiry receives special notice in the next chapter.

² *Implies* is more often used when a principle or general truth brings about belief in some other truth; the other phrases are more frequently used to denote the cases in which one fact or event leads us to believe in something else.

³ Mill, *System of Logic*, Introduction, §5.

⁴ Locke, *Of the Conduct of the Understanding*, first paragraph.

⁵ In another place he says: "Men's prejudices and inclinations impose often upon themselves. . . . Inclination suggests and slides into discourse favorable terms, which introduce favorable ideas; till at last by this means that is concluded clear and evident, thus dressed up, which, taken in its native state, by making use of none but precise determined ideas, would find no admittance at all."

⁶ *The Conduct of the Understanding*, §3.

⁷ *Essay Concerning Human Understanding*, bk. IV, ch.XX, "Of Wrong Assent or Error."

⁸ Hobhouse, *Mind in Evolution*, p. 195.

⁹ Denoting whatever has to do with the natural constitution and functions of an individual.