How We Think

John Dewey

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PREFACE

Our schools are troubled with a multiplication of studies, each in turn having its own multiplication of materials and principles. Our teachers find their tasks made heavier in that they have come to deal with pupils individually and not merely in mass. Unless these steps in advance are to end in distraction, some clew of unity, some principle that makes for simplification, must be found. This book represents the conviction that the needed steadying and centralizing factor is found in adopting as the end of endeavor that attitude of mind, that habit of thought, which we call scientific. This scientific attitude of mind might, conceivably, be quite irrelevant to teaching children and youth. But this book also represents the conviction that such is not the case; that the native and unspoiled attitude of childhood, marked by ardent curiosity, fertile imagination, and love of experimental inquiry, is near, very near, to the attitude of the scientific mind. If these pages assist any to appreciate this kinship and to consider seriously how its recognition in educational practice would make for individual happiness and the reduction of social waste, the book will amply have served its purpose.

It is hardly necessary to enumerate the authors to whom I am indebted. My fundamental indebtedness is to my wife, by whom the ideas of this book were inspired, and through whose work in connection with the Laboratory School, existing in Chicago between 1896 and 1903, the ideas attained such concreteness as comes from embodiment and testing in practice. It is a pleasure, also, to acknowledge indebtedness to the intelligence and sympathy of those who coöperated as teachers and supervisors in the conduct of that school, and especially to Mrs. Ella Flagg Young, then a

colleague in the University, and now Superintendent of the Schools of Chicago.

New York City, December, 1909.

PART ONE: THE PROBLEM OF TRAINING THOUGHT

CHAPTER ONE WHAT IS THOUGHT?

§ 1. Varied Senses of the Term

Four senses of thought, from the wider to the limited 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.

Chance and idle thinking I. In its loosest sense, thinking

signifies everything that, as we say, is "in our heads" or that "goes through our minds." He who offers "a penny for your thoughts" does not expect to drive any great bargain. In calling the objects of his demand thoughts, he does 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.

Reflective thought is consecutive, not merely a sequence 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.

The restriction of thinking to what goes beyond direct

observation Reflective thought aims, however, at belief II. 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 the man telling a story if he saw a certain incident happen, and his 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.

Thought induces belief in two ways III. 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, "Men 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]

Thinking in its best sense is that which considers the basis and consequences of beliefs IV. 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.

Reflective thought defined Men thought the world was flat until Columbus thought it to be round. The earlier thought was a belief held because men 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 is a common element in all types of thought: 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.

viz. suggestion of something not observed But reflection involves also the relation of signifying 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.

Various synonymous expressions for the function of signifying 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 and belief on evidence 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.

The importance of uncertainty (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.

and of inquiry in order to test (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.

Finding one's way an illustration of reflection 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.

Possible, yet incompatible, suggestions 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.

Regulation of thinking by its purpose 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

Origin and stimulus 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.

Suggestions and past experience 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.

Exploration and testing 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

Man the animal that thinks 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

The possibility of deliberate and intentional activity I. 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. He does not "know what he is 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.

Natural events come to be a language 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.

The possibility of systematized foresight II. By thought man also develops and arranges artificial signs to remind him in advance of consequences, and of ways of securing and avoiding them. As the trait just mentioned makes the difference between savage man and brute, so this trait makes the difference between civilized man and savage. A savage who has been shipwrecked in a river may note certain things which serve him as signs of danger in the future. But civilized man deliberately makes such signs; he sets up in

advance of wreckage warning buoys, and builds lighthouses where he sees signs that such events may occur. A savage reads weather signs with great expertness; civilized man institutes 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; civilized man builds 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; civilized man invents 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.

The possibility of objects rich in quality III. 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 him 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.

The nature of the objects an animal perceives An English logician (Mr. Venn) has remarked that it may be questioned whether a dog sees a rainbow any more than he apprehends the political constitution of the country in which he lives. The same principle applies to the kennel in which he sleeps and the meat that he eats. When he is sleepy, he goes to the kennel; when he is hungry, he is excited by the smell and color of meat; beyond this, in what sense does he see an object? Certainly he does not see a house—i.e. a thing with all the properties and relations of a permanent residence, unless he is capable of making what is present a uniform sign of what is absent—unless he is capable of thought. Nor does he see what he 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.

Mill on the business of life and the occupation of mind 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 he has not directly observed: not from any general purpose of adding to his stock of knowledge, but because the facts themselves are of importance to 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

Thinking goes astray 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.

Ideas are our rulers—for better or for worse 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 man ever sets himself about anything but upon some view or other, which serves him for a reason for what he does; and whatsoever faculties he employs, the understanding with such light as it has, well or ill informed, constantly leads; and by that light, true or false, all his operative powers are directed.... Temples have their sacred images, and we see what influence they have always had over a great part of mankind. But in truth the ideas and

images in men's 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

Physical and social sanctions of correct thinking 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.

The serious limitations of such sanctions 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 he hunts, 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.

Superstition as natural a result as science 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.

General causes of bad thinking: Bacon's "idols" 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. ειδωλα, images), spectral forms that allure the mind into false paths. These he called the idols, or phantoms, of the (a) tribe, (b) the marketplace, (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 on the influence of 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: (a) dependence on others, 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."

(b) self-interest, 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]

(c) circumscribed experience 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 men, 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." Men 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.

Effect of dogmatic principles, 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 men, 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."

of closed minds, 2. "Secondly, next to these are men whose understandings are cast into a mold, and fashioned just to the size of a received hypothesis." Such men, 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.

of strong passion, 3. "Predominant Passions. Thirdly, probabilities which cross men's appetites and prevailing passions run the same fate. Let ever so much probability hang on one side of a covetous man's reasoning, and money on the other, it is easy to foresee which will outweigh. Earthly minds, like mud walls, resist the strongest batteries.

of dependence upon authority of others 4. "ity. 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."

Causes of bad mental habits are social as well as inborn 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

A leap is involved in all thinking 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.

Hence, the need of regulation which, when adequate, makes proof 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 himself because he had to prove his 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.

The office of education in forming skilled powers of thinking 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

Only native powers can be trained. 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.

Hence, the one taught must take the initiative 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.

Three important natural resources 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

Desire for fullness of experience: 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) physical (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) social (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) intellectual (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 he aspire to the office of kindling or even increasing it. His task is rather to keep alive the sacred spark of wonder and to fan the flame that already glows. His 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."

The dimensions of suggestion: (a) ease The function of suggestion has a variety of aspects (or dimensions as we may term them), varying in different persons, both in themselves and in their mode of combination. These dimensions are ease or promptness, extent or variety, and depth or persistence. (a) The common classification of persons into the dull and the bright is made primarily on the basis of the readiness or facility with which suggestions follow upon the presentation of objects and upon the happening of events. As the metaphor of dull and bright implies, some minds are impervious, or else they absorb passively. Everything presented is lost in a drab monotony that gives nothing back. But others reflect, or give back in varied lights, all that strikes upon them. The dull make no response; the bright flash back the fact with a changed quality. An inert or stupid mind requires a heavy jolt or an intense shock to move it to suggestion; the bright mind is quick, is alert to react with interpretation and suggestion of consequences to follow.

Yet the teacher is not entitled to assume stupidity or even dullness merely because of irresponsiveness to school subjects or to a lesson as presented by text-book or teacher.

The pupil labeled hopeless may react in quick and lively fashion when the thing-in-hand seems to him worth while, as some out-of-school sport or social affair. Indeed, the school subject might move him, were it set in a different context and treated by a different method. A boy dull in geometry may prove quick enough when he takes up the subject in connection with manual training; the girl who seems inaccessible to historical facts may respond promptly when it is a question of judging the character and deeds of people of her acquaintance or of fiction. Barring physical defect or disease, slowness and dullness in all directions are comparatively rare.

(b) range (b) Irrespective of the difference in persons as to the ease and promptness with which ideas respond to facts, there is a difference in the number or range of the suggestions that occur. We speak truly, in some cases, of the flood of suggestions; in others, there is but a slender trickle. Occasionally, slowness of outward response is due to a great variety of suggestions which check one another and lead to hesitation and suspense; while a lively and prompt suggestion may take such possession of the mind as to preclude the development of others. Too few suggestions indicate a dry and meager mental habit; when this is joined to great learning, there results a pedant or a Gradgrind. Such a person's mind rings hard; he is likely to bore others with mere bulk of information. He contrasts with the person whom we call ripe, juicy, and mellow.

A conclusion reached after consideration of a few alternatives may be formally correct, but it will not possess the fullness and richness of meaning of one arrived at after comparison of a greater variety of alternative suggestions. On the other hand, suggestions may be too numerous and too varied for the best interests of mental habit. So many suggestions may rise that the person is at a loss to select among them. He finds it difficult to reach any definite conclusion and wanders more or less helplessly among

them. So much suggests itself pro and con, one thing leads on to another so naturally, that he finds it difficult to decide in practical affairs or to conclude in matters of theory. There is such a thing as too much thinking, as when action is paralyzed by the multiplicity of views suggested by a situation. Or again, the very number of suggestions may be hostile to tracing logical sequences among them, for it may tempt the mind away from the necessary but trying task of search for real connections, into the more congenial occupation of embroidering upon the given facts a tissue of agreeable fancies. The best mental habit involves a balance between paucity and redundancy of suggestions.

(c) profundity (c) Depth. We distinguish between people not only upon the basis of their quickness and fertility of intellectual response, but also with respect to the plane upon which it occurs—the intrinsic quality of the response.

One man's thought is profound while another's is superficial; one goes to the roots of the matter, and another touches lightly its most external aspects. This phase of thinking is perhaps the most untaught of all, and the least amenable to external influence whether for improvement or harm. Nevertheless, the conditions of the pupil's contact with subject-matter may be such that he is compelled to come to quarters with its more significant features, or such that he is encouraged to deal with it upon the basis of what is trivial. The common assumptions that, if the pupil only thinks, one thought is just as good for his mental discipline as another, and that the end of study is the amassing of information, both tend to foster superficial, at the expense of significant, thought. Pupils who in matters of ordinary practical experience have a ready and acute perception of the difference between the significant and the meaningless, often reach in school subjects a point where all things seem equally important or equally unimportant; where one thing is just as likely to be true as another, and where intellectual effort is expended not in discriminating between things, but

in trying to make verbal connections among words.

Balance of mind Sometimes slowness and depth of response are intimately connected. Time is required in order to digest impressions, and translate them into substantial ideas. "Brightness" may be but a flash in the pan. The "slow but sure" person, whether man or child, is one in whom impressions sink and accumulate, so that thinking is done at a deeper level of value than with a slighter load. Many a child is rebuked for "slowness," for not "answering promptly," when his forces are taking time to gather themselves together to deal effectively with the problem at hand. In such cases, failure to afford time and leisure conduce to habits of speedy, but snapshot and superficial, judgment. The depth to which a sense of the problem, of the difficulty, sinks, determines the quality of the thinking that follows; and any habit of teaching which encourages the pupil for the sake of a successful recitation or of a display of memorized information to glide over the thin ice of genuine problems reverses the true method of mind training.

Individual differences It is profitable to study the lives of men and women who achieve in adult life fine things in their respective callings, but who were called dull in their school days. Sometimes the early wrong judgment was due mainly to the fact that the direction in which the child showed his ability was not one recognized by the good old standards in use, as in the case of Darwin's interest in beetles, snakes, and frogs. Sometimes it was due to the fact that the child dwelling habitually on a deeper plane of reflection than other pupils—or than his teachers—did not show to advantage when prompt answers of the usual sort were expected. Sometimes it was due to the fact that the pupil's natural mode of approach clashed habitually with that of the text or teacher, and the method of the latter was assumed as an absolute basis of estimate.

Any subject may be intellectual In any event, it is desirable that the teacher should rid himself of the notion

that "thinking" is a single, unalterable faculty; that he should recognize that it is a term denoting the various ways in which things acquire significance. It is desirable to expel also the kindred notion that some subjects are inherently "intellectual," and hence possessed of an almost magical power to train the faculty of thought. Thinking is specific, not a machine-like, ready-made apparatus to be turned indifferently and at will upon all subjects, as a lantern may throw its light as it happens upon horses, streets, gardens, trees, or river. Thinking is specific, in that different things suggest their own appropriate meanings, tell their own unique stories, and in that they do this in very different ways with different persons. As the growth of the body is through the assimilation of food, so the growth of mind is through the logical organization of subject-matter. Thinking is not like a sausage machine which reduces all materials indifferently to one marketable commodity, but is a power of following up and linking together the specific suggestions that specific things arouse. Accordingly, any subject, from Greek to cooking, and from drawing to mathematics, is intellectual, if intellectual at all, not in its fixed inner structure, but in its function—in its power to start and direct significant inquiry and reflection. What geometry does for one, the manipulation of laboratory apparatus, the mastery of a musical composition, or the conduct of a business affair, may do for another.

§ 3. Orderliness: Its Nature

Continuity 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.

Practical demands enforce some degree of continuity In the main, for most persons, the primary resource in the development of orderly habits of thought is indirect, not direct. Intellectual organization originates and for a time grows as an accompaniment of the organization of the acts required to realize an end, not as the result of a direct appeal to thinking power. The need of thinking to accomplish something beyond thinking is more potent than thinking for

its own sake. All people at the outset, and the majority of people probably all their lives, attain ordering of thought through ordering of action. Adults normally carry on some occupation, profession, pursuit; and this furnishes the continuous axis about which their knowledge, their beliefs, and their habits of reaching and testing conclusions are organized. Observations that have to do with the efficient performance of their calling are extended and rendered precise. Information related to it is not merely amassed and then left in a heap; it is classified and subdivided so as to be available as it is needed. Inferences are made by most men not from purely speculative motives, but because they are involved in the efficient performance of "the duties involved in their several callings." Thus their inferences are constantly tested by results achieved; futile and scattering methods tend to be discounted; orderly arrangements have a premium put upon them. The event, the issue, stands as a constant check on the thinking that has led up to it; and this discipline by efficiency in action is the chief sanction, in practically all who are not scientific specialists, of orderliness of thought.

Such a resource—the main prop of disciplined thinking in adult life—is not to be despised in training the young in right intellectual habits. There are, however, profound differences between the immature and the adult in the matter of organized activity—differences which must be taken seriously into account in any educational use of activities: (i) The external achievement resulting from activity is a more urgent necessity with the adult, and hence is with him a more effective means of discipline of mind than with the child; (ii) The ends of adult activity are more specialized than those of child activity.

Peculiar difficulty with children (i) The selection and arrangement of appropriate lines of action is a much more difficult problem as respects youth than it is in the case of adults. With the latter, the main lines are more or less settled

by circumstances. The social status of the adult, the fact that he is a citizen, a householder, a parent, one occupied in some regular industrial or professional calling, prescribes the chief features of the acts to be performed, and secures, somewhat automatically, as it were, appropriate and related modes of thinking. But with the child there is no such fixity of status and pursuit; there is almost nothing to dictate that such and such a consecutive line of action, rather than another, should be followed, while the will of others, his own caprice, and circumstances about him tend to produce an isolated momentary act. The absence of continued motivation coöperates with the inner plasticity of the immature to increase the importance of educational training and the difficulties in the way of finding consecutive modes of activities which may do for child and youth what serious vocations and functions do for the adult. In the case of children, the choice is so peculiarly exposed to arbitrary factors, to mere school traditions, to waves of pedagogical fad and fancy, to fluctuating social cross currents, that sometimes, in sheer disgust at the inadequacy of results, a reaction occurs to the total neglect of overt activity as an educational factor, and a recourse to purely theoretical subjects and methods.

Peculiar opportunity with children (ii) This very difficulty, however, points to the fact that the opportunity for selecting truly educative activities is indefinitely greater in child life than in adult. The factor of external pressure is so strong with most adults that the educative value of the pursuit—its reflex influence upon intelligence and character—however genuine, is incidental, and frequently almost accidental. The problem and the opportunity with the young is selection of orderly and continuous modes of occupation, which, while they lead up to and prepare for the indispensable activities of adult life, have their own sufficient justification in their present reflex influence upon the formation of habits of thought.

Action and reaction between extremes Educational practice shows a continual tendency to oscillate between two extremes with respect to overt and exertive activities. One extreme is to neglect them almost entirely, on the ground that they are chaotic and fluctuating, mere diversions appealing to the transitory unformed taste and caprice of immature minds; or if they avoid this evil, are objectionable copies of the highly specialized, and more or less commercial, activities of adult life. If activities are admitted at all into the school, the admission is a grudging concession to the necessity of having occasional relief from the strain of constant intellectual work, or to the clamor of outside utilitarian demands upon the school. The other extreme is an enthusiastic belief in the almost magical educative efficacy of any kind of activity, granted it is an activity and not a passive absorption of academic and theoretic material. The conceptions of play, of self-expression, of natural growth, are appealed to almost as if they meant that opportunity for any kind of spontaneous activity inevitably secures the due training of mental power; or a mythological brain physiology is appealed to as proof that any exercise of the muscles trains power of thought.

Locating the problem of education While we vibrate from one of these extremes to the other, the most serious of all problems is ignored: the problem, namely, of discovering and arranging the forms of activity (a) which are most congenial, best adapted, to the immature stage of development; (b) which have the most ulterior promise as preparation for the social responsibilities of adult life; and (c) which, at the same time, have the maximum of influence in forming habits of acute observation and of consecutive inference. As curiosity is related to the acquisition of material of thought, as suggestion is related to flexibility and force of thought, so the ordering of activities, not themselves primarily intellectual, is related to the forming of intellectual powers of consecutiveness.

CHAPTER FOUR SCHOOL CONDITIONS AND THE TRAINING OF THOUGHT

§ 1. Introductory: Methods and Conditions

Formal discipline The so-called faculty-psychology went hand in hand with the vogue of the formal-discipline idea in education. If thought is a distinct piece of mental machinery, separate from observation, memory, imagination, and common-sense judgments of persons and things, then thought should be trained by special exercises designed for the purpose, as one might devise special exercises for developing the biceps muscles. Certain subjects are then to be regarded as intellectual or logical subjects par excellence, possessed of a predestined fitness to exercise the thought-faculty, just as certain machines are better than others for developing arm power. With these three notions goes the fourth, that method consists of a set of operations by which the machinery of thought is set going and kept at work upon any subject-matter.

versus real thinking We have tried to make it clear in the previous chapters that there is no single and uniform power of thought, but a multitude of different ways in which specific things—things observed, remembered, heard of, read about—evoke suggestions or ideas that are pertinent to the occasion and fruitful in the sequel. Training is such development of curiosity, suggestion, and habits of exploring and testing, as increases their scope and efficiency. A subject—any subject—is intellectual in the degree in which with any given person it succeeds in effecting this growth. On this view the fourth factor, method, is concerned with providing conditions so adapted to individual needs and powers as to make for the permanent improvement of observation, suggestion, and investigation.

True and false meaning of method The teacher's problem is thus twofold. On the one side, he needs (as we saw in the

intangible condition from the points just dealt with; for automatic skill and quantity of information are educational ideals which pervade the whole school. We may distinguish, however, certain tendencies, such as that to judge education from the standpoint of external results, instead of from that of the development of personal attitudes and habits. The ideal of the product, as against that of the mental process by which the product is attained, shows itself in both instruction and moral discipline.

External results versus processes (a) In instruction, the external standard manifests itself in the importance attached to the "correct answer." No one other thing, probably, works so fatally against focussing the attention of teachers upon the training of mind as the domination of their minds by the idea that the chief thing is to get pupils to recite their lessons correctly. As long as this end is uppermost (whether consciously or unconsciously), training of mind remains an incidental and secondary consideration. There is no great difficulty in understanding why this ideal has such vogue. The large number of pupils to be dealt with, and the tendency of parents and school authorities to demand speedy and tangible evidence of progress, conspire to give it currency. Knowledge of subject-matter—not of children—is alone exacted of teachers by this aim; and, moreover, knowledge of subject-matter only in portions definitely prescribed and laid out, and hence mastered with comparative ease. Education that takes as its standard the improvement of the intellectual attitude and method of students demands more serious preparatory training, for it exacts sympathetic and intelligent insight into the workings of individual minds, and a very wide and flexible command of subject-matter—so as to be able to select and apply just what is needed when it is needed. Finally, the securing of external results is an aim that lends itself naturally to the mechanics of school administration—to examinations, marks, gradings, promotions, and so on.

Neglect of the innate logical resources Identification of logical with subject-matter, exclusively 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 formulæ 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.

Illustration from geography, 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.

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.

Genesis of thought contemporaneous with genesis of any human mental activity 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.

Fixation of bad mental habits (c) In any case positive habits are being formed: if not habits of careful looking into things, then habits of hasty, heedless, impatient glancing