Thinking Ways

When we think about thinking, as when we think about remembering and imagining, we are apt to make the objects too much like those of ordinary physical perception. We do this partly by making those physically perceived objects too much like those surrogate ones we think of as the objects of memory, imagination, and thinking. That is, the conventional modern account, the propriety in the matter, is to regard, as John Locke taught us to do, "whatsoever is the object of the understanding when a man thinks" as an "idea"—a mental picture or quasi or pseudo picture. All these ideas are ontologically like each other and each is numerically and (except for an idea of an idea) ontologically different from the real, if any, for which it stands. The "concept" differs a bit, to be sure, but mysteriously and not ontologically, and it serves the role of an idea as being that which is present to or in the mind when the mind thinks or when there is thinking.

Then in the more popular view there are different
faculties—sensing, remembering, imagining, thinking—to do their respective jobs on the ideas that are there. With the technical philosophers the faculties are out, as is the mind itself, and the pictures, the appearances and concepts, must differ on their faces (which is all they have) so as to announce themselves not only as chairs and not tables but also as sensed or remembered or imagined chairs. Indeed, they must not only announce themselves (for there is nothing to announce themselves to), they must so differ in themselves or their aggregation as to constitute memory as different from sensing, imagination as different from memory, thinking (possibly) as different from the others.

I have liked to ask doctoral candidates, especially in history, in their oral examinations how they know the past. They say by present images. Then how do they tell the present image of the past from the present image of the present? They say it is less vivid (especially if they have read Hume). But how do they tell the present image of the past from the present imaginative image of the distant in space or the never was, and how do they tell what part of the past the present image applies to? This they think unfair.

And it is. It is not cricket to be peremptory with theories of perceiving and thinking, since none has ever been offered us, so far as I have heard, which is not inadequate, or absurd, or nonsensical—indeed all three. I include my own acceptance; although of course I think it is best.

I would accept knowing as the original fact—mind,
whether it be spirit or matter or organization or what, knows—a fact not to be accounted for or unpacked or analyzed but to be used as barely as may be in accounting for other, less basic, facts. It has been the effort to account for knowing in terms of more complex and artificial facts which has kept us confused and bemused. Further, it is the mind, the self, an enduring and changing thing, a conspective thing, that knows; neither the things known nor their pictures ever are or can be knowing (“knowledge” is a word well avoided). When I use my external sense organs, I perceive physically. When I turn my mind to what is not physically before me and perhaps never physically was, I may be said to imagine. When it is my own past I know, I remember. I actually see the star that was a million years ago and I remember what I ate yesterday; in both cases without image.

I should prefer to keep content firm—and external and direct—in sense perception; to make memory and imagination a matter of “thinking that” we perceive, without any image content; to allow thinking no content except that of perception, memory, imagination, abstractions from them (not concepts), and symbols. I would assign to thinking the processes of association of words or ideas, calculation by rule and ordinarily with symbol, the imaginings of things as they are not and the choice of outcome, perhaps with some of the imaginings being of what is incapable of reduction to any items of “experience,” incapable of any ostension;
and with the choice of outcome having the distinctive flavor we call assertion, the making of a cognitive bet. The processes of these sorts of thinking are very much the same, but not just the same, as those that surround the central fact of knowing in sense perception and in memory and fancy: direction of attention, entertainment, recognition, discrimination, selective attention, valuational choice. I should like to keep the “faculties,” the ways of knowing, as nearly one as may be and find the differences in what is known.

Thinking, surely, is more than the knowing that is remembering and imagining (and sensing). It builds more complex processes around it—unless it is just “thinking of”—for it is “thinking about” and it seeks to add that assertion which Descartes called the intrusion of free will into the cognitive.

And what is known is whatever it is, not knowledge. This is to say there is no mental content, although there are minds and mindings. There are things and their characters, their qualities and doings and relations and values; these are minded directly in perception and indirectly in memory and fancy. Thinking is at least in part and sometimes (or it may be always) made up of these, especially of fancy as a thinking of things or characters as they are not but might be. Yet it is hard to believe that thinking is nothing but this. We come to feel the need to add to our inventory of things and their characters when we try to be clear as to that which we are thinking of when we are thinking about some-
thing. But what we need to add is by the same token just as unclear. When the mathematician talks of the function of a complex variable, when the moralist says it is always wrong to lie, what is it that he is directly or indirectly minding?—what thing, what quality, what action, what relation that could be shown or described or could be denoted by even a perfect phenomenological language? Of course sometimes there may or must be such items. The moralist may picture a little boy with mouth circled with jam and saying, “I didn’t get into the jam.” The mathematician may use as an instance an elliptic curve—if I understood one of my mathematician students yesterday. Talking of a very pretty discovery of identity and zero he drew such a curve on the board, and I have seen the jam boy in comics: clear ostensions. But this sort of thing is not what we mean or not all we mean by the theory of complex variables or by the categorical imperative.

I think what we need is even more of that separateness of the mind from its objects and its ability to survey and stand off or above which allows us to deal with the differences of remembering and imagining. For even if I do not believe in appearances of things, surely things—present, past, absent,—appear differently to me. Yet the remembered and the imagined bear little firm on-their-face difference. I know, however, what I am doing with my attention—that I am peering into my past, or into recorded past, or into the actual world not now visible to me, into the world of fancy, of
THINKING WAYS

fiction. And so, too, I am aware of what I am thinking about even if not of just what I am thinking of—the field within which I have to imagine, construct, choose, assert.

Sometimes, but only sometimes, this is simply described. I have a maze: I am to imagine a path out. I have scrambled letters: I am to rearrange them into a word. I have the problem of perception: I am to imagine and accept that story of things, activities, faculties, objects, assertions which has the most adequacy and the least nonsense and absurdity. But exactly what is before the mind when it thinks of “activity” in order to do its job of thinking about thinking? I have the problem of what is common among the good solutions of my problem, the good steak, the good act of heroism, the good woman. Now the problem seems to founder on its own topic. What is before the mind when we say “good”? It is not hard to imagine something of the several cases and of our “pleasure” or “approval,” and then to say it is the presence of the latter we mean by “good”: “for we do not strive for, wish for, long for, or desire anything because we deem it to be a good; but we deem a thing to be good because we strive for it, wish for it, long for it, or desire it.”

1 Spinoza: Ethics, III, 9.

39
If there are, as in some sense there must be, some goings on corresponding with what we call present perception, memory, imagination, then it is natural to suppose that some perception is of actually present existing things. (It may be that these are in part perceived as they are, that we can have signs of when they are so perceived, and that they are perceived without the interposition of any idea, image, representation. I hold all three theses.) It has of late been fashionable to become doubtful of the givenness of perception, to let interpretation intrude upon the “datum,” to become doubtful of the actual existence as perceived of the things presently perceived. I think the motive of this is quite sound; but often it seems a product of our sudden predilection for staring at pictures of empty polyhedra, stairs, and little creatures alternatively rabbits with ears or gazelles with open mouths.

The older habit was to take present perception as firm content but as representative, and then to take everything from there on as less satisfactory content (or occasionally as at times in Plato and Descartes, to reverse this). “Concepts,” which sprang out of, but are probably not in all fairness to be blamed on, Abelard’s ingenious contrivances, then became the content for thinking. I have for a long time not been content to believe in concepts or been able to understand what they are supposed to be or to be like, although I have thought I understood what purposes they were supposed to serve. And since early graduate-student days
I have been unwilling to say I believe that representative ideas make up present perception. I think that when we remember or imagine we think that we are presently perceiving (knowing the while that we are not) the thing remembered or imagined. When we think (intellectually, abstractly, logically, discursively, creatively) we think of and with present, remembered, imagined things, qualities, actions, relations (intracorporeal as well as external), and values. And whatever in all this seems to be present—the sun on the tent I lived in as a boy in summer—is so, and not by any kind of representative. But this leaves gaps and puzzles. At least, I remain insistent on keeping real, direct, honest perception of things and ostensive or some “real” definition in common sense, poetry, and religion, regardless of rabbit-gazelles, and regardless of white whales.

And what then is the mind? It is a thing, or a thing-part of a thing, or a character of a thing as its activity or set of relations. And the thing of which mind is a part or activity may be the body, or the soul, or the person. At any rate mind is not composed of its own “mental contents”—one of the chief modern delusions, it seems to me.

Whitehead, Cassirer, Mrs. Susanne Langer have emphasized symbols and the use of symbols—“Man is a symbol-using animal.” Others, like Mr. Paul Tillich, with somewhat other meanings for “symbol,” have joined the chorus. There is a later chapter on symbols. Here it seems safe to say that surely symbols are often
what is before the mind or are the vehicle by which the mind does what it does when it is said to be thinking. But the symbol is not original and ought not to be final; it stands for, is vicarious, surrogate (but is not representative except as explicit picture or ikon). Symbols are a way of making calculation possible. As the symbol is the substitute for the real thing so calculation is the substitute for real thinking. Not only may that which is calculated be thought (though more slowly and hazardously than by a good calculator and a good calculus) but also the calculus itself presupposes real thinking sometime before. One may formulate a formula for calculatingly creating a calculus; but this is not original, is not the real creation. Logic lets us avoid the labor of thinking, but sometimes logicians must think.

Now I am not sure whether animals use symbols. They certainly use signs. But if they use symbols in the way of a calculus they must also have some power of real thinking. If man is the symbol-using animal it must be that he is also the symbol-making animal, the animal that can understand and direct and question and deny and prefer. This perhaps is what is meant by the old-fashioned, "Man is a rational animal."

The important difference is that calculation is a matter of rule not necessarily demonstrative and that thinking—reason—is free. This goes along with the fact that calculation is easy and thinking is hard. We seldom take the trouble to be free. Freedom and rationality is an old and a beautiful partnership in human
notions. But only too often it has fallen into a calculated pattern of the obedience to law, and the obedience even to a perceived-as-so or a "self-imposed" or "autonomous" law has too much the feeling of the schoolboy following the algebraic formula, and freedom becomes no more than the absence of compulsion by force. Reason is radically free because, although it is perceptive of what is, what is includes value as well as fact; and reason is perceptive of what-is-not in the sense that imagination is; so that the soul that exercises its rationality may, must, create and choose as well as just perceive and follow. Reason is radically unpredictable; but not random as is chance. So nothing is more trustworthy than reason, despite its unpredictableness. God is free and "in Him is no evil at all," and "before the hills in order stood," "eternal are thy mercies, Lord," "who was and is and is to be," and "our defense is sure," "a refuge never failing"; yet not God himself, I believe, can foreknow or predict (although He can promise and fulfill) what He will do. Our unpredictableness, thus, is not only by the fallibility of our reason but by its essence.

This is not meant to be mysterious. Partly, I should have to admit, it is not understood. But I think it will seem mysterious to some because of the feeling that in every situation it must be the case that there is one proceeding or choice which is the best; that this is a matter just of descriptive characters of what is, or of the possible choices and their outcomes, which could be known;
and that the goodness, betterness, bestness must be a function of some criteria which are commensurable and possess the transitivity of a true serial order. Then it is felt that insofar as reason sees, it must do, as a billiard ball supposedly obeys the composition of forces upon it. I have come to think all these propositions neither needful nor true.

Reason is the cognitive aspect of that aspiration which is the opposite of weariness and both the ground and opponent of depravity. When the mere possible rock becomes an existent rock, it finds it must obey the law of gravity and the second law of thermodynamics (although even here I believe there is that chance which is neither cause nor freedom). If it rejoices in this activity of motion and impact, also it must often be tired and wish for the absolute rest of the merely possible. When the inorganic becomes organic, the plant now finds it must both obey the simple laws of physics and at times rise superior to them; must push up against gravity to the sunlight and reverse the law of entropy by using its chlorophyll to concentrate energy to higher forms. The lower laws become its pleasure but not its glory, and there is still the weariness that calls for cessation. The animal carries on the tale of obedience, of gratification in the carried-over lower nature, of glory in rebellion and superiority, of aspiration in the new movement and sense, and of weariness. And so does man, with a weariness that daily leans back to the animal and sometimes when even the plant life becomes a
THINKING WAYS

burden all the way back to the rock and the merely possible; man, with his aspiration now in reason, a new dimension of freedom; and perhaps a new power to use what is remnant from the lower as expressive of the aspirant. The farthest back seems too universal perhaps for most of us to use; but the nearer remote of animal and plant nature become the capital of modesty, the resource both of the indulged exertion of lust and the lyric sharing of love.

"Oft was I weary when I worked at thee." But there is reason to suppose that the pulling of the oar put the boat to some worthwhile change of place. Weariness is not just opponent of aspiration. It makes rest sweet after decent effort, sweeter after some accomplishment. Someone said the saddest lines in English poetry are those about Michael: "Many and many a day he thither went/And never lifted up a single stone." Here is the wiping out of aspiration by the defeat of oneself in another—the defeat of the old man in the disgrace of his son—the loss of the capacity for action which will make weary.

What made me think of Michael? Why should I suppose something "made me" do so? Well, was thinking of Michael pure chance or pure freedom or some complex of just these two? These are my two rubrics beyond the making of something happen that we call cause. As just coming to one, such a quotation cannot be choice, free or calculated. I suppose one could say a sentence, then decide to add a quotation, then think up or
look up and inventory a lot of apposite ones, and choose. This would involve a lot of choice but not choice only; and, although I like to quote, I do not believe I have ever done it this way. And equally the thinking of Michael was not just chance, for the lines are apposite, to my attention and my intention—at least, to my preceding words. That I should think in this fashion was, I take it, largely chance; what I thought of was, we say, “by association”—“association of ideas” we used to say, now not so often. Perhaps it is “free association,” but how free is free association? If we go back to Hobbes and Locke we see it is meant as free of deliberative guidance, “unguided” as opposed to “regulated” Hobbes says. I should say, free of free choice and calculation, but should also willingly say, more in their words, not directed, not steered, not led by open attention to the end of the discourse or to the rules of calculation.

It is well to note that things like “thinking of Michael” are in Hobbes’s story rather than Locke’s. Hobbes’s “unguided thinking” and Locke’s “association of ideas,” though they are taken together in histories and were in history pretty certainly connected, are two. Hobbes’s rubric will cover Locke’s, which is also unguided; but Hobbes is considering a succession of ideas somehow connected in meaning. Locke has shifted attention to what thereafter was and is usually suggested by “association of ideas”: a “degree of madness” in which our minds bring up ideas at the same time which have pre-
viously come to us together in some repetition or vividness but which in themselves have no “agreement or repugnancy,” are “loose and unconnected” (in Hume’s phrase). So Hobbes’s linking is more logical or phenomenological, Locke’s more of psychological or indeed physical cause. Both are unguided by conscious intention. Thinking of Michael is like Hobbes’s “malicious question” as to the value of the Roman penny when the conversation was on the English Civil War. (Delivering up King Charles—Jesus—thirty pieces of silver—Roman penny.) It is much less like Locke’s “pain and displeasure” belonging to the pleasant room where one has suffered or the need of the gentleman dancer for a piece of furniture like that beside which he had learned to dance.2

But notice how close yet far we can come. To one who knows the poem the word “Michael” may bring the idea of, or actual, sadness. There is no essential connection of the sound, the shape, the word, or the name “Michael” with sadness. But the story of this man named Michael is in itself sad. By chance or cause or by Lockean association our minds may be brought to the token “Michael,” this “makes us think” of the conclusion of Wordsworth’s poem, which we believe and feel to be sad, and so comes sadness or some further associate of sadness; all without regulation.

With Hobbes and Locke it doubtless seemed the puz-

2Leviathan, Pt. I, Ch. 3. Essay Concerning Human Understanding, Bk. II, Ch. 33.
zle was to see how people come to connect those “loose and unconnected” ideas. We have come to think we understand that puzzle, for as things or events, which is what our science wants to deal with, they are not loose and unconnected but neurally and temporally conjoined. And even as “ideas” their lack of logical connection is no bar to their being connected in our experience under the principles set forth by Hume (following Aristotle) of resemblance, contiguity, cause and effect. Actually in Hume (with cause disintegrated into association and resemblance played down) these three principles become the one principle of contiguity, com­ presence in time and space, thus letting us think the ideas have come into connection mechanically and so they reappear together mechanically. So the difficulty comes to be how ideas, no matter how logically connected (logic being no matter), precipitate one another in the actual flow of what comes before our attention. How is it that of two thoughts, as Hobbes calls them, which may never have come to me at the same time, one should now follow the other as though produced by it?

This is easier if it be a case of conscious derivation of one from the other by rule, as in deduction or in much of what is called induction—calculation either in logic or in mathematics. That there is a difficulty is clearer when there is suggestion, recognition, some leap from the one to the other—and it is the leap that seems typical of all real thinking. Even this seems, perhaps deceptively, not preposterous to an old-fashioned
believer, as I am, in a real self, which by that power I call reason can see several things, in fact or value, at the same time and imagine others partly like and different, judge, and stand back and judge the judgment. And I suppose if I find this ability of the mind or the person (not of the ideas—no "mental chemistry") not preposterous, I can allow it to operate without conscious regulation or effort or searching, a sort of freedom allowing itself to operate by habit. And there is wide range from our sheerest and broken reveries when half asleep to the very wakeful and alert state of the lecturer who is fully attentive to what he is saying and to his audience, and yet to whom sometimes the continuing discourse seems almost to be carrying itself.

We have worked from a fragmentary thinking about Michael to what it was a fragment of: discourse and discourse freshly carried on, being made not reproduced. I have been using three rubrics: "words carrying themselves along," calculation, and thinking. The last I had associated closely with free choice, not making them identical. Choice is one of my three fundamental rubrics for the characterization of event: chance, cause, choice. Cause and choice "produce" the event; to call it chance says it just happens, is unproduced. But discourse is a series of events and must be explicable under the three eventual rubrics. So far as thinking is freedom and choice it may be said to produce what is said (with the assistance of the larynx and such). The others (words carrying themselves and calculation) and think-
PROPRIETIES AND VAGARIES

ing in part, are not true producers but represent our way of distinguishing different modes and procedures of discourse. But as the discourses do eventuate, the modes should be analyzable by the sorts of chance, cause, and choice that enter in.

I hurry to add that I do not suppose these rubrics, these divisions, even the basic ones, to be given in nature and imposed upon our honesty. Such seem always in some degree capable of being differently divided out; the hands can be put back in the deck, reshuffled, and new hands dealt. Chance, cause, and choice served Epicurus (see the end of his letter to Menoeceus) and some others and they have served me so well I should hardly change the list. But I know that, even apart from questions of fact—the mighty debates about “fixed fate, free will, foreknowledge,” and simple chance which sometimes fatalists and mechanists and freedomists, Calvinists and providentialists and Arminians all seem to dislike more than they dislike one another—I know that divisions into different sets of powers, faculties, and processes are possible. If, for example, we shake cause loose so that, as sometimes seems in Aristotle with the refractoriness of matter, it is never dependably precise, we could telescope chance into cause. But there are advantages in the notion of cause as precise, apart from the love of the precisionist; and if we were to use chance to liberalize cause itself, we would then still need the intrusion of some chance into freedom, which would mess up the simplicity of our analysis.
THINKING WAYS

Plato says to carve the turkey at the joints. But south of Henry VIII's table we usually carve more than at the joints, and some persons like their slices thin and some thick and some (carvers) like hunks. Anyway the turkeys of science and philosophy have hard-to-find joints or too-easily-imagined joints and much meat. Certainly that fowl that is philosophic psychology, in which we are now indulging, is indefinitely jointable.

Having rejected mere chance, full choice, and careful calculation as the nothing-but way of "thinking about Michael" or in general of the discourse that seems to carry itself along, but having allowed each some role, we still seem to need some help from cause, as a before-to-after precipitation. But cause here is a curiously learned and artificial regimen. Although like mechanical cause in that it works from behind forward, it is unlike in that we trace it in a logical series, not a physical one (it, of course, doubtless has basis in a physical-cause series in the brain cells or neuronic paths and energies). Such cause is also in calculation, in progress by rule as in mathematical and logical derivation: adding a column of figures, going on with a syllogistic or symbolic deduction. Here, too, as in the run-on of association, rational choice is minimized at the time and is further minimized as the recognition of rule and application of rule become more automatic in habit. But cause could not thus work here except for the fact that thinking and choice had earlier been at work, for this cause is by stipulation and acceptance. Here, as not in association, chance, too, is minimized. So the calculation can
be built into a machine and the cause made cleanly physical. In mental calculation chance interferes, and thinking steps in to correct, criticize, create, direct; but so too with the computer the expert may step in to repair, ask questions, add variables or operators, to design better questions or a better machine.

The second of our questions about Michael as well as the first included a widely causal, a consequential, word. "What made me think of Michael? Why should I suppose something made me do so?" That "should," taken along with the "make," could be a clue to the old maze of determinism and indeterminism; of my chance, cause, and choice.

So in discourse which is at all intentional, when we are at all "thinking about what we are saying," notably in "thinking on one's feet," there are three modes: letting the words run, proceeding by rule, really thinking by exercising the inspection and imagination of the reason directly on whatever it is one is thinking about—not on the semantic words or on the syntactic or pragmatic rules. Probably none of these is ever pure, or absent.

There is, of course, also discourse which may be indistinguishable in the hearing from what we have been talking about but which is not at the time intentional: something read, memorized, repeated in hypnotism, produced or reproduced by a machine. Here cause rules, although imposed on materials or processes more than causal. A machine can be made to read from a printed
THINKING WAYS

page. Human reading is almost necessarily more than reading. How curious indeed and complex is “reading a paper”: we see shapes, translate them into sounds, recognize the generally synonymous meaning of the two, and know the meaning; we applaud, wince, criticize, correct, reject, alter by the use of calculative rule and esthetic judgment and thinking, and chance steps in to make us skip, add, misread.

Where in these modes do proprieties function? Not in cause, which is sub-artifice. Not in reason, which may be the parent of artifice but is not itself artifice but its corrector. Proprieties, like anything, may be the object of reason; and hypocritically among the objects proprieties may be the solicitor of reason; but by definition of reason proprieties cannot be the pusher and causer of reason. Calculation may get its rules by artifice and, even if it finds its basic rules in uttermost reality, must select and arrange them or their derivatives by artifice. But, once given, the rules run the show and are a safeguard from fashion. Nevertheless, it is by fashion some of the materials are put into the calculation. These are calculated with and are not here being criticized (calculation may elsewhere be used in criticism of these same proprieties); so here proprieties may determine as the “material cause” determines. And in associative discourse proprieties are a constant and major determinant in this material way; and, along with habituated rules of logic and rhetoric, in the directive way of an undeliberate calculation; and, most of all, as the
solicitor and precipitant of undeliberate choice. Thus fashion set the problems and many of the "facts" of the *Malleus Maleficarum*, the *Hammer of the Witches*. Most of those problems and facts seem to us utterly nonexistent; and our proprieties push us or pull us to ignore or dismiss the book—unless we chance or choose to examine it and find the subtlety and power of its logic and its perception within its context. Then we may find ourselves its admirers or choose to be its admirers—and still be its contemners, remembering Johannes Kepler, or less its contemners, remembering Gilles de Rais.

The end frequently takes us to the beginning. "Michael" begins, "If from the public way you turn your steps/Up the tumultous brook of Green-Head Ghyll,/... No habitation can be seen." If you come into the Hopkins campus by one entrance you can turn, a few feet from busy Charles Street, off the pavement by a dirt road up a steep hill a hundred yards or so through big oak and beech trees. Part way up, in the summer time, nothing but the woods—and woods-earth and sky—can be seen; although you know near by are the Power House and Whitehead Hall and the Barn and the tall apartment houses across Charles Street. Just a remnant clump of trees, but it is a true woods. I love the woods, and I love trees better yet; sometimes I think I love oak trees more than anything else in the world. There must be something here of that difference of levels, of the feeling for the earlier, simpler, more
basic; for the animal, even the botanical itself; which allows me to feel—which makes me feel—for the trees and allows me to use them in the restful relapse from—as well as in the expression of—the human ideal. For simply on the “higher” present level the statement about my loving oak trees is silly—silly to weigh the love of oak trees in the same balance with the love of certain human beings or even certain undertakings.

That it should be especially oaks among the trees is biographical, of my boyhood summers at camp in a large grove of the biggest white and black oaks I have ever seen—even, if you will, of previous biographies of mine, but not earlier ontologies or racial levels. Now, in objective ways, the white-barked beech trees on our campus are, I think, more lovely than the oaks; but I love the oaks more. If all this, “Be but a vain belief, yet, oh! how oft-... when the fretful stir/Unprofitable, and the fever of the world/Have hung upon the beatings of my heart-/How often has my spirit turned to thee!... How often has my spirit turned to thee!,” and my body also.

Trees, and oak trees: the thorough-bass of prerational motives and of childhood’s building, these, although not prior to consciousness as physics may be taken to be, are prior to artifice and so, in essence, prior to proprieties. And they very powerfully move our feelings and our projects and our recoveries. Upon and around and against these we impose calculation and design and planning. I believe planning, which occupies so much
of some persons' time and so many archival pigeonholes, is pretty futile even in today's doing. The things called plans for a building or a bridge are designs, needed and, if competent, determinative. The actual builder may design his working force and looking ahead to day-by-day exigencies may plan but, if he is a good builder, I suspect he saves that time and meets the day-by-day with sagacity and ingenuity and, of course, Aristotelian good habits. Also upon our background natures and in, through, and around our calculations and designs and plans, are associations, fashion, proprieties—or our reactions against these. And then there is real thinking, freedom, the crown of the rational, perception and creation in fact, in truth, in value.

An example of this "wonder of beauty," real thinking? Here is the fifth race at Pimlico, and I want to make a bet. Probably I will not think much or at all about it. Maybe I have heard "information" and accepted it (why I accepted it is now in the past). I follow the tip, meanwhile anticipating the cash and good feeling I am about to have. I may follow a hunch—like association—some verbal trick with a horse's name or a feeling not based on any consideration of causal factors about to come into play on the track. Or I may calculate: I am a figure handicapper and add, subtract, weigh, and derive figures assigned to the Pimlico track and its conditions. I consider the weather today and each horse's fondness or the opposite for Pimlico, slow track, and muggy atmosphere; the "index
number” representing how long it has been since the horse’s last race and his last time in the money; the distance of the race and the horse’s time for that distance; his assigned weight, post position, rider, trainer, owner and any immediate change of ownership or trainer or rider—and I get a resultant figure for each horse and am supposed to play the highest or lowest.

But I may really think about the race to come. I take all the facts the calculator uses and more (although some I may dismiss) but instead of turning them into numbers or even words I take them in their own right. I assemble them and see them coming together, conflicting, developing, emerging, perhaps from the horse’s last year at this time or the previous year (for many horses are seasonal): from this morning’s blowout and his record of works; from the morning breakfast in the trainers’ coffee room, into the paddock, onto and around the track, the start and the turns, to the climax at the finish line. I know all these imaginings are tentative, but they are thought and not dreamed or fancied, and so I feel the relative probabilities without numbering them; and all this I do while standing in the paddock and looking at the coat and eye and gait of each horse; the grooms, trainers, riders; the saddling and instructions which I cannot hear. The final decision of my judging reason with included scraps of calculation and association sometimes surprises me. And, of course, I also know the most preposterous outcomes are not infrequently actual. All my thinking may fail to turn
PROPRIETIES AND VAGARIES

up a good bet (there are still the odds to be considered) or after the thinking I may even think about the thinking, and in either case maybe I put my money back in my pocket and enjoy the spectacle.

I am convinced I could know perfectly all the facts, of all sorts, and still go wrong. Chance is always there. I used to want to write a story about the man who comes home forlorn after a day of missed long shots and is granted to go back in time again, with the memory of how things have already happened, to the start of that day's racing with conditions precisely the same (except his memory): same horses, weather and jockeys. He bets the winners that were, but a new set wins. This not only could happen (on the impossible and perhaps in part unimaginable assumption), I believe, but in some degree would happen. So what I have said about thinking at the race track, a sort of thinking which may be one ingredient or aspect of planning, does not contradict my depreciation of planning. And the world is larger and less isolated than the race track; large, intricate, and indefinitely subtle as that lesser world is.

The man at the end of the otherwise empty bench down beyond the grandstand at the Laurel race track climbed up on the bench, as the horses came around the stretch turn and went on by toward the finish line to the right. He was very much excited, but very quietly. "I think he lost and I lost," he was saying—began saying at the eighth pole.
It was a close finish between two horses with the one on the outside apparently winning.

"Who was that out there?" he asked. The photograph sign had gone up. "Number 2," replied someone in front. "Number 2," said the concerned man, "Sir Sag. Sir Sag—that was my top horse." And he took a yellow card from his pocket and looked at it forlornly. "That's good for the card. That's good." But he said it forlornly.

I recognized him as a maker and seller of tips.

"I put all I had left, all my money, on Handle," he remarked to no one.

I knew why. Handle was an even-money favorite.

And Handle was the other horse in the picture. But the man did not know that.

"Yes, Number 2 first and Number 6 second," said front seat.

"Number 6?" the man questioned, "Number 6? That's Handle. If he was second he saved me. I put it all on him to place."

"Of course, he's second. Anybody could see that," front seat said.

"Four dollars," the man said. "My last four."

Then the numbers went up and Handle had won.

And I thought of the old-timer—for this was an old-timer, a tip seller and race follower, not a tout. The crowds say the old-timer does not get excited any more—but this was the most excited man I saw all day.

At the last race, as the horses came down past the crowd, up in the grandstand a youth leaped up and
down, waved both arms over his head, and shrieked, "Hit him! Hit him! Hit him hard!" "You may be betting my horse, mister," I said beside him, "but I hope you lose." He did not hear me—and he was not really concerned anyway. My old friend with the four dollars was concerned so much so he could not see—though he knew how to see—that the horse he bet and the horse he picked and expected to bet were out front all by themselves.

He picked one when it came to his last four and played another. Well, he was an expert, he knew enough to know, or feel, how little his expertness was worth. Maybe, maybe not, he also believed his expertness was still the best thing he had to go on. He was not asking people's quarters dishonestly. And yet for his last four, he could not resist that even money.

And I thought of Descartes.

The next race I was sitting down on the front bench when the horses came on the track. There was another even-money favorite, though he had not opened as such. And a man I had never seen before came, stood behind me, and observed, "They sure went to that Number 1—bet him like they knew something." Then in what seemed to me utter contradiction, "Yeah, he looks like a cinch. I don’t think they'll ever be close to him.” To a friend walking up he called out, "Well, any excuses? Find any way the favorite can lose?"

This favorite was not close, but he did get second. And why did I think again of Descartes? Because
last year I had been struggling to find out what Des-cartes meant in his central emphasis upon knowing what we mean, upon clarity, upon “dividing difficulties”; and one of the things I decided he meant was a call for the actual imagining of the actual operation of whatever it is we are talking about. And it can be added that it is often hard, sometimes impossible, to do so competently, and that it is easy, tempting, to skip it, even sometimes in fields where our familiarity should make it easy. Often since then, but especially at the race track, I have been reminded of that.

Favorites are made by people betting. Yet one of those who make a living by advising people how to bet will run from his own advice to follow the bets he supposedly is directing. Is he swayed by the apparent weight of contrary authority? Does he suspect “stable money”? It could be; but he has ways of checking the facts and he has seen such authority and such money lose many times. Last night he would have said “So what?” Usually he does not stop even to say “So what?” but goes on and bets his selections. Today, for his last four, it is just that even money; no hypothetical figuring on what he might imagine, only the massive unimaginable.

And the man behind me: he had figured the entries and Number 1 did not then seem a standout. But after that even-money sign went up and stayed—“He looks like a cinch. They won’t get near him.”

And those who complain an owner did not tell them
his horse was going to win; do they ever ask themselves precisely how the owner came by the information he failed to impart? And those who talk of fixed races or of an owner’s “not letting him win today”; do they ever ask themselves just what they think of as actually being done?

There are ways of fixing a race—not often tried and often failing—but it is not accomplished by a magical decision, even a decision of all the owners or all the trainers or all the jockeys or even of all of these—and of all the horses. It is simpler to keep some one horse from winning than to make some one horse win, but still is not magical, especially after the prices are seen. All that the most accomplished rider can do is to intimate his desires to the horse and encourage him to comply. The horse is carrying the rider.

But I started to write about Descartes and clarity. Is it not strange that the preacher of clarity who is regularly, and not undeservedly, praised for his clarity, is clearly not clear as to what he means by his method, especially by that rule most often repeated as his: the rule of analysis—to divide so as to be clear.

Well, we “divide difficulties,” as he tells us in the second of his four famous rules in the Discourse, sometimes when the difficulties are practical and temporal by considering successive performances or phases of performance. To do so and to consider and actually to face one performance at a time (even though we also need to have an eye to the others) is excellent advice
practically; and it has its advantages for science also, though these are lesser.

And we can divide a geometrical problem this way if it is one of construction and we can do it spatially in the case of some of the theorems. This was, of course, effective in Descartes' thinking.

Then there are the divisions of objects, like chairs, and of assemblages, like clubs. We can divide a chair into its structural parts: seat, back, legs, rockers; and into its material parts: blocks, chips, and splinters of wood, perhaps molecules, atoms, electrons. And we can divide a club into its member clubs or member individuals.

We can also divide "chair" into its sorts: rocking chair, straight chair, arm chair. And we can divide "chair" into its definitional parts: a-piece-of-furniture-for-sitting— into genus and differentia and each of these into theirs if any.

We can divide not only a club but also a nation into its federal states and its citizens, its members. We can divide an animal or vegetable organism into its members, which are neither federal nor individual. We can divide a church, a board, a mathematical set, a logical class, an assemblage, a species into its members.

We can divide a thing into its existence, its quality, its activity, and its relations. We can divide its quality into its component qualities. We can divide color into its particular shades.

We can divide a motion or a force into its com-
ponents—as Descartes did in his geometrical analysis of force and motion.

These are, at least some of them, very different. Any may be but none must be at any time the sort of composition and division requisite for Descartes' purpose.

One frequent combination of divisional tasks is where we have a "vague" word or a "mixed mode" which must be defined or at any rate have its denotations sifted out and then these isolated in temporal and causal successions. Part of this is Locke—another of the ways in which John Locke is a good Cartesian.

The same requirement is behind many of the vague rules in present textbooks of scientific method, particularly on the subject of hypotheses. "Hypotheses must be clearly formulated," and "formulated so as to be capable of being tested." These chiefly mean "You should know what the hypothesis means in the sense that you can describe the actual occurrences supposed to follow one another in whatever context it is you are working in."

The safest—Descartes was a formalizer of this course—is hypothesis as a story of the motion of simple things in space and time. For here our imaginings are clearest and most communicable. I do not see, however, that one can command this sort of story of hypothesis ahead of time.

And this perhaps was Descartes' trouble (as it had been Bacon's with his other type of motion doctrine). He wanted and he got this master rule of space-mo-
tion in severe form, and it was a rule that worked beautifully for his longed-for mathematical physics and anatomy and that continued to work amazingly for much of future natural science. But he did not want just to announce or prescribe the world as the world on which his method would work. He was offering a method, a radical and universal method. He wanted to prove the material he worked on—at least to prove the justice of his choice of that material—in his own advising, by the tests of his method. And the method itself, should it not be accomplished by the method? At least the explanation and justification of a method fundamentally commanding clarity should not be clearly unclear. Yet the material for, or embodiment of, his method material, seems hypothetical or empirical. The method does, I think, find its justification in intuitive clarity, but its abstract explanation is far from clear. And it seems to be hard to make Cartesianly clear either the necessity of space and motion or the limitation of clarity to space and motion.

I do not think clarity should be so limited. I think the Cartesian method is a general one, although not everywhere equally adept. The use of the method is subsequent to the acceptance of some subject matter: Cartesian space-time and motion for Cartesian physics; phonetics and meaning for linguistics; horses and humans and weather for horse racing. Can the method take as its subject matter the question of what subject matter should be accepted for study? Possibly, but only
with some specification of purpose and hence of some genus of subject matter. So it might be said we do not have to be Cartesian in physics—we can be Aristotelian; or use Bacon’s qualitative, internal, quasi-chemical motions; or look for a new physics in quantum mechanics. And it may seem that Cartesian physics offers a maximum of Cartesian clarity, not only among rival physics but also among nonrival topics of curiosity.

So the four rules in the *Discourse* are distressingly unclear. Repeated back to teachers by generations of students they make me think of Bacon’s phrases about the universities, where “alas, they learn nothing but to believe: first to believe that others know that which they know not; and after, that themselves know that which they know not.” And yet they are the rules for clarity by a thinker and writer not undeservedly famous for clarity. So, earlier, the first eleven and a fraction rules of the *Rules for the Direction of the Mind* are involved, abstract, and probably more unclear than the brief passage in the *Discourse*. It is not until after the opening paragraphs of Rule XII (where “Selections” are apt to cut off) that light comes, especially in the examples. And then it comes with apology, for the treatment now has to be based on a psychology-physics which, no matter how neat, Descartes cannot claim as established, but only as hypothetically possible and here serviceable.

Kant might have justified it “transcendently” as

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3 “Mr. Bacon in Praise of Knowledge.”
THINKING WAYS

necessary for the method (and this method doubtless derives from Descartes in part) but Descartes had not got around to this; and of course the assurance of the method could be denied and it is still more of a question whether it could be made out that the space-time-motion manifold is the only allowable physics for a Cartesian method.

Later on, with the aid of the cogito, the self and the notion of "attribute," God, and the world, Descartes thought he had clearly established his long-held and long-bothersome hypothesis or faith of extension and motion. But he seems not to have thought so and not to have rearranged the theory of matter into extension until some time after he had told the story of cogito-self-God-world in the Discourse. From the Meditations on, this helped him to be clearer about the method—after he had quit writing books about it. But the proof is surely disputable.

And it seems curious that the key step—one which seems more than he was entitled to—was taken in the Discourse in respect of the self to give it its one attribute of thinking. If it were then applied to the outside world to give it its one attribute of extension his desired establishment of his physical faith would have been made. And in that case the historian would be tempted to say Descartes' need had moved him to the extra taking. And that might somehow be, but at any rate Descartes put off cashing in on his venture. The step is taken in one sentence, after the paragraph of the
“I think, therefore I am” (and the argument of the one sentence is never really added to here or in later works). “From that I knew that I was a substance the whole essence or nature of which is to think . . . and even if body were not, the soul would not cease to be what it is.” Descartes might claim that by the cogito he has shown both that he exists and that consciousness, “thinking,” is not only the sufficient but also the only ground of such showing. I do not see any Cartesian clarity in the inference from this that thinking must be the only attribute or even that it is an attribute—essential character—of the self. Thus, even if one presupposes (as Descartes does not seem to) that every substance has one and only one attribute, the fact that, in ratione cognoscendi, consciousness is the one way of proving one’s existence does not say that in ratione essendi consciousness is inseparable and the only aspect inseparable from one’s existence. Suppose a person is a body which once in a while happens to be conscious. In such moments and only then he would be able to be aware of existing and to prove to himself that he exists. But all the while he goes on existing, I have come to feel that Thomas Hobbes in his “Objections” to the Meditations—for all his apparent unwillingness to be fair to Descartes—is right in his pivotal denial of the security of Descartes’ proof of the simple thinkingness of the self and that Descartes is even more apparently impatient of understanding Hobbes. This reverses what I once felt.


68
THINKING WAYS

And it remains that a method of spreadout point-to-point continuous-line clarity is, as Bacon insisted science should be, a method of "dissection" rather than "abstraction," but that abstraction cannot simply be eliminated. In nature dimensions are more real than sets; and sets, in logic, are less real than classes, and classes less real than characters. An extensive logic always has an advantage: in applicability, power, calculability; and is always inadequate in the end. Every now and then the powerful extensive calculator catches a glimpse of his bareness and cries for help from his confused intensive mother. Extensive logic, too, abstracts; indeed it abstracts the more in that it abstracts from "extension" and sets which have already left out (been abstracted from) much of the concrete world. But thus it gets closer to the map, and to that form of abstraction we call mathematics; it gets further from words and meanings. When we "divide" in definition and classification (going up and sideways to genus and differentia or down to species) we are abstracting in Bacon’s sense. Can we eliminate this or the syntactics that go with it? Surely the worldly, sagacious, inquisitive politician and essayist who "wrote philosophy like a Lord Chancellor" did not eliminate this even in his science. Indeed any "real physics" in Bacon’s demand or any metaphysics must take account of sorts of things, of the difference and relations of sorts, characters, and things, of some real definitions—must be more than a reproduction, a proper-name inventory, or a Baconian or Cartesian map or geometry thereof.
I have found that students almost unanimously when they want politely to call some notion or statement fuzzy, vague, obscure—a case of not knowing what one is talking about—will use the word "abstract." There are such abstractions, many of them the descendants of Locke's "mixed modes." But abstraction began (at least half of it) in pursuit of precision, simplicity, clarity—Cartesian virtues. Even the abstracting of classes and definitions can achieve a clarity of its own, getting in under Descartes' method although not now of visual, geometrical, or physical dissection.

And there are two other considerations favoring "abstraction." We can sometimes, perhaps always, maneuver up on classification or even metaphysics by putting it into a descriptive story, thus using a sort of Cartesian physics. An English-composition way of stating the Cartesian method is to say that argument or exposition must become description and narration, and that any part of it that is to claim clarity must have no gaps. Descartes himself called on this and gave the Discourse some of its readability and understandability by putting much of it in the form of a biographical story.

The other consideration is that Cartesian physics is itself a severe abstraction and in history on through Newton to Einstein becomes more so—not an abstraction of classes but of one aspect of the "dissectible" world, its time-space-motion. That all the actual substantial world can be reduced to and in some sense predicted from that rarefied aspect is the Galilean-Car-
tesian (and, with a difference, Baconian) assumption: a radical if not a rash one, and it is no wonder they shunned announcing it. This abstraction retreats closer and closer to the master abstraction of mathematics. It is the "machine in the ghost" of the farmer's real world of red, juicy apples and of God that stirred Berkeley to revolt. It becomes true of more and more, and less and less true of the more and more; or, if you please, more and more true of a more and more severe abstraction, a more recondite substructure, of the familiar world. And it becomes more constructive, more formally stipulational, in its abstraction. Newton's law of the inverse squares for masses taken as ideal points follows Descartes' vortexes; non-Euclidean geometry brings a new provisionalism and helps Einstein find a more submerged formalism to get together Newton's particles and electrical fields. (Quantum mechanics may be closer to Bacon than Descartes.) But physics always keeps hold of the actual world at least through some tie of operational definitions and measurement. It is measurement that holds descriptive geometry to metric geometry, and it is physical measurement—meter, gram, second, and how many—that holds metric geometry and formal physics to the actual world; that bridges the universal-individual gap and the "inductive leap." Not all things, most will say, can thus be measured and so not all things can share the Cartesian method at its best.

At any rate this is one effort to think about thinking, one account of bon sens as the intuitive reason or light
of nature that can be the occasional overseer of cause and association in discourse, can be the associate of freedom in its adventures in the event world of cause and chance; and so is at once the enabler and the critic of proprieties. It would not do here to deny—and it is not needful here to affirm or deny—that there is a mysticism beyond reason just as there is a faculty of immediacy in reason; nor is there any wish to praise Descartes' as the only or the best methodization of the uses of reason.

All manners of thinking have their uses; but for intellectual knowledge certainly and perhaps in some sense for any, even mystic knowledge, one has to look back to and forward to some Cartesian ideal of completeness and clarity, with nothing left out that is relevant and nothing left in that is unresolved, so that intuition, induction, and deduction (the three modes of the Rules for the Direction of the Mind) may freely inspect, survey, infer. But also we learn—in a sense something becomes clear to us—by a sort of synthesis not Cartesian, by dint of doing; as we may say that in the three hundred years since Descartes it has become clear to us that clarity and thinking are a longer task, have more to do, than Descartes and Bacon thought. I think we have learned that assurance is more apt to be negative than affirmative (compare "These two lengths are equal" and "These two lengths are not equal"); that being sure that we are unsure whether
THINKING WAYS

two, especially quantities, are the same (consider "I think these two lengths are equal but I do not know") is the birth of the invention of instruments and so in part the birth of science. I think we have also learned that certainty is in relations rather than in qualities, but that in relations is also the optional and the arbitrary (we may argue about the name of a color but we have to see it as we see it, whereas we may see, and describe, geometrical steps going this way or that way); that among the clearest "that's" of our awareness is the awareness that what we perceive is vague, confused, not clear: the certainly (but not unchangeably) uncertain, the clearly (but not hopelessly) unclear.