



CHAPTER V

THE ART OF THINKING

I GLANCE at my study window and for a moment my thoughts mingle with the images which seem to be painted upon the glass. Beyond the hard geometric pattern of the balcony railing I can see the green waves of the Bois enveloped in the faint bluish mist of a Parisian morning. At the horizon rises a line of hills, and the hospital on the wooded slope of Mont Valérien looks like a Florentine monastery encircled by black cypresses. A flight of swallows passes across the pale sky thinly veiled by clouds. Far off towards Versailles some aeroplanes are wheeling and droning; they call up memories of war, aerial bombardments, and sirens groaning in the night. Then the green foliage and the



singing of birds are forgotten and I fall to thinking of the death of a civilization, of the end of the Roman Empire, of a little town on the Algerian coast, prosperous and charming in the third century, but nothing but a tragic empty ruin a hundred years later. My thoughts turn to the possible fate of our capitals.

Thus my reverie concerns not only the things of the present, but contains visions of distant lands, recounts ancient happenings and evolves theories as to the unpredictable future. My mind seems like a little interior world in which is reflected the huge exterior universe without limit of time or space. Philosophers have sometimes called this reduced model of the universe a *microcosm*, and the immense world we live in, and would like to understand and transform, a *macrocosm*. "Man's mind, like an angel," wrote an alchemist in the Middle Ages, "takes possession of all things that are enclosed in the macrocosm." Let us say rather that the mind *tries* to take possession of all things and that the reflection of the world within us is distorted like the sky and the flowers in a silver garden ball.

My reverie is greatly confused because the mirror as well as the objects, the microcosm as well as the macrocosm, are perpetually moving. There is now before me a picture that seems more or less clear: the iron railing, the foliage of the trees, the birds, and the hills at the horizon. But all memory, anticipation, and reasoning are at the mercy of the waves of the sea within us. My ignorances, my passions, my errors, and my forgetfulness cause distortion, but everything continually undergoes changes that are new and strange. In our minds the world is like a map whose contours are confused and whose boundaries are shifting; we must nevertheless use the map constantly.



The desire to think clearly should make us hesitate a long time and search carefully, but the need to act is urgent. The health of a child is failing rapidly. What is his sickness? Is it physical or mental? Whom should we consult? Is medicine of any use? Is it a true science? What is a science? A lifetime would be required to study these questions seriously, but what can we do? Answers must be found, for our patient is dying. There is not sufficient time for an exploration of the outside world, and the only view of it immediately at our disposal is the tiny confused one which our mind offers.

What we call thought is man's effort to guess or foresee, by combining symbols and images, the effects his actions will produce in the world of reality. All thinking is the sketching out of an action, and after this sketch will be painted, not without corrections, the picture of our life. In order to act correctly we must, according to Pascal, make an effort to think correctly. What is correct thinking? It is to make our little interior model of the outside world as exact as possible. If the laws of our microcosm resemble fairly closely those of the macrocosm, if our map represents with relative precision the country through which we must travel, there is some chance that our actions may be adjusted to our needs, our desires, or our fears.

Are there methods by which man can control his thoughts so that his actions will fit easily into the existing scheme of things? Is it possible to draw an exact map of the universe, to achieve definite ends by means of this map, and to reach chosen ports?

It seems that the thoughts of most use in the universe of things are those recorded upon living bodies in the form of instincts or habits. A cat leaps upon a table covered with objects. It stands there gracefully and



effortlessly, without breaking a cup or brushing against a vase. Such a series of movements implies a careful calculation of strength required and an exact choice of the spot to land upon. But neither the calculation nor the choice was conscious. The cat thought with its muscles and its eyes. The sight of the table enabled it to decide upon the motions that would be necessary, and the visualizing of these motions produced in turn the positions to be taken by its feet, its back, and its head.

In the same manner a tennis-player, a football-player, a fencer, or an acrobat thinks with his body. The fencer never has time to say to himself that, since his opponent is doing this, he will do that. He thinks with his foil and his fingers. As a boy, I did gymnasium work and I knew that when I used the parallel bars I had to be exact in my calculations. If I could imagine my body balanced in the air, could measure in advance the extent of its wavering, and chose (during this anticipatory thinking) the fraction of a second in which my biceps had to be contracted and my legs raised to accelerate the motion, then, as though by a miracle, everything became easy. But if there was the tiniest break in the film, if it was out of focus for a few millimetres, the rhythm broke down and the projected exercise became impossible.

It is not by a process of reasoning that the sculptor decides to change the curve of a hip; a direct communication has been established between his eyes fixed upon his model and his fingers caressing his statue. Like the gymnast, the artist thinks with his body. Some living things learn to think with the bodies of others. An animal thinks with the herd. If panic seizes a flock of sheep, each animal runs with the flock, not because it understands the reason for the panic, but because the fundamental instincts of its kind teach that if a sheep



does not follow the flock it will be at the mercy of its enemies. Like those animals, mentally undeveloped men, children, and crowds are extremely susceptible to instinctive and corporeal thinking.

On a steamer I once encountered a boy four or five years old crossing the Atlantic alone; he had been put in charge of the captain. No adult would have been capable of his adroitness in picking out the passengers who liked him and those who were annoyed by him. He loved the friendly ones and avoided the others. Undoubtedly he was guided by signs which to us would have been imperceptible. After a quarrel two lovers are not reconciled by words; a sigh suddenly produces a smile, their eyes meet, and their bodies draw together. Soon they are in each other's arms, far more certain of an agreement than if a long palaver had calmed them.

We may thus take it that bodily thinking which controls some of our actions with extraordinary sureness really exists. But its range is short. The mole thinks very satisfactorily with its feet, but it cannot think farther than its feet. It knows nothing of the many unsightly molehills that are formed in a green lawn, nor does it realize the fury of the gardener or the unpleasant consequences of this fury for the race of moles. An aviator has precise reflexes which enable him to make safe landings, but he has had nothing to do with inventing the aeroplane. The statesman who administers the finances of a country cannot think with his body. He cannot even think, as the gymnast does, by means of mental pictures of actions, because these pictures would be too numerous. If his duty is to improve the economic position of millions of people, he cannot say to himself, "I'm working for this shopkeeper or that farmer whom I've seen, or for that jobless man whose difficulties I am



aware of." In order to speed up his thinking, he must replace these pictures of human beings, fields, houses, and industries by signs and symbols representing either a person or a thing, or all persons belonging to a certain class; and these symbols are words.

The workman, juggler, or gymnast who thinks with his hands manipulates objects which have weight and resistance: bricks, balls, or his own body. The man who thinks with words manipulates merely sounds or symbols, and this makes action singularly easy. At a hotel you lift the telephone and pronounce the word "tea." In a few moments you are miraculously brought a cup, a saucer, a spoon, bread, milk, marmalade, a pot of tea, and hot water. Imagine the complexity of real actions necessary to the production of these things for you. Think of the Chinamen growing the tea, choosing the leaves; the English steamer carrying it; the captain and his crew fighting a storm; the Périgord cowherd driving his beasts to pasture, milking them; the engineer of the train carrying the milk; the baker kneading the bread; the Spanish or Provençal girls picking the oranges for the marmalade—one spoken syllable has put all these people at your service.

The man who thinks with his hands has a limited effect upon the universe; he acts only upon what he touches. The man who thinks with words can, without effort, set peoples, armies, and continents in motion. Let the head of a Government pronounce the word "mobilization," and with this tiny act, requiring of him nothing more than an imperceptible movement of the lips, he will drag all the men in Europe from their homes and families. He will fill the sky with bombers having the power to annihilate hundreds of cities; he will bring about the destruction of a world and the end of a civilization.



When one considers the possible effects of a single word, one realizes that language may have been regarded as a magic power by primitive peoples. Kipling's Hindoos searched for the "master word" that would give them power over men and things. Faust hunted through the old books of the alchemists for formulas to evoke or drive away spirits. In the Arabian Nights "Sesame" opened a door; this was a legend, but a true one. In all societies there are words that open doors and words that evoke evil spirits. Every speaker earns his dinner with some "Sesame"; every riot is started with a master word.

The man who thinks with his hands moves heavy objects and moves them slowly, brick after brick, with successive displacements. His care is assured by the very difficulty of his actions. He is obliged to maintain this correspondence between the exterior and interior world which we have discussed as the guarantee of true thinking, for if he does not do so the bricks will bruise his hands, he will fumble the balls he is juggling, or fall from the parallel bars in the gymnasium. But actions are too easy for the thinker with words; the delay between error and punishment is too long for him to realize his responsibilities. He plays with flimsy symbols and forgets the terrible consequences that may follow. He is tempted to take, as Leibnitz said, "the straw of words for the grain of things," and to believe that everything has been done when only words have been spoken.

The difficulty is that things have resistance. One can say everything with words. Napoleon III said: "The principle of nationalities must be respected." And this abstract phrase, which could be taken for truth because it evoked no precise image, has brought about the destruction of modern Europe. An economist, sitting at his desk, writes: "To increase salaries is to increase



purchasing power and therefore put an end to the crisis." These words were as good as any others; they had a flavour of truth, and the economist wrote them in all good faith. Actually, the measures they inspired did not end the economic disorder. Why? Because the microcosm could not influence the macrocosm; because there was a divergence between words and things; because a simple phrase did not represent with sufficient exactitude the complexity of the situation.

It would be a dangerous and terrible thing if, in order to judge of the value of a phrase or a formula, one had to wait for its good or evil results. It is natural that, from the beginning of civilization, wise men should have searched for a surer method of handling explosive symbols. In the manner of present-day traffic regulation, men have tried to regulate the circulation of words. This came to be called logic. Logic ought to be the art of following, in the handling of words, certain rules that would also be guarantees because the rules of the interior world would coincide with those of the exterior world. What we call the laws of human reason are rules for thinking, valid for all men in every age. Some of them are obvious—for example the principle of non-contradiction: a thing cannot be both itself and its opposite. One cannot say simultaneously: "Two and two make four," and, "Two and two make five"; or "This dress is white," and, "It is black"; or "I want this country to be free," and, "I want it to be servile." For many years men have hoped that a kind of error-proof grammar of thinking could be based upon clear fundamental principles. This logic, which was Aristotle's and, in the Middle Ages, adopted by the Scholastic Philosophers, is a discipline not to be despised; it is even indispensable. It guarantees our



reasoning against certain errors, but it cannot constitute an art of thinking, for the following reasons :

Logic cannot invent; it must continually reiterate that A is A. If it adds anything, it must borrow either from experience or intuition, both of which are outside the range of logic. Logic allows one to say : " This dress is a dress," but only experience permits one to add that the dress is fragile or that it is pleated. Kant has done away with the folly of expecting pure reason ever to get on without experience : " In its passion to enlarge its knowledge, reason, made confident by this proof of its power, imagines the expanse of the infinite to be widening before it. The fleet-winged dove, rapidly cleaving the air and feeling its resistance, thinks it would fly much better in a vacuum. Thus Plato, scorning the physical world which keeps reason within such narrow limits, ventures beyond into the empty spaces of pure understanding. He does not perceive that he is making no progress despite his efforts ; he lacks the solid basis necessary for his support from which his thought may be set in motion." Many of our political reformers flutter about vainly in the empty spaces of pure understanding.

Logic has certainly made men's minds flexible ; it has given them an agility they lacked, but also the dangerous habit of believing that all is accomplished when they have indulged in a process of reasoning which has the appearance of truth. The history of philosophical doctrine shows that, in the course of centuries, men have been able to prove almost everything. They have proved the truth of contradictory philosophies and then their falsity ; they have proved the necessity for democracy and also its impossibility ; they have proved both the separateness of races and their confusion. " All proofs," said the philosopher Alain, " are for me clearly discre-



dited.” Actually, one *can* prove everything if the words one employs are not clear and precise.

A demonstration in algebra is irrefutable because each term is so exact that the demonstrator can say nothing that is beyond his listener’s understanding. Identities in logic are actual identities, but the words used in speaking of emotions, of the conduct of government, of economics, are vague words which may be employed in the same argument with several different meanings. To reason with poorly chosen words is like using a pair of scales with inaccurate weights.

The Cartesian method is an attempt to eliminate certain errors from such reasoning. “I had a strong desire,” said Descartes, “to learn to distinguish the true from the false, in order that I might act with a clear vision and go through life with assurance.” We must remember the famous rules of his art of thinking. The first is: *accept a thing as true only when one clearly recognizes it as such.* This may seem too simple. “Why,” you ask, “accept a thing as true if I do not believe it to be so?” Descartes replies to your question by laying down another rule: *be careful to avoid haste and prejudice.*

Haste is to be avoided because man cannot understand difficult things quickly. The student who skips through the pages of his textbook will never learn geometry. But men are usually in a hurry—some are compelled to be. An examination has to be taken on a certain day and a whole science or the history of a whole period must be studied before that day arrives. The expert promises to hand in his report within a given time; a Government waits; if the expert delays too much, some arbitrary decision will be made; an incomplete report is better than none at all. The journalist would prefer just a few



hours more in which to consider a new and obscure question, but the printers are already asking for his copy and the paper must catch the train at two in the morning.

Others are in a hurry because of their vanity. They hate to admit ignorance of anything. A specialist thinks himself disgraced if he has to reply: "I must look into this." In government, business, and society, men speak authoritatively upon questions with which they are unfamiliar. Someone will tell you about Czechoslovakia without ever having been there or even studied its history and customs. Another will give an unfavourable opinion of our aviation when he knows nothing of it except from incompetent observers. Still another will tear a woman's reputation to bits by telling untrue stories of her private life. The average value of conversations could be enormously improved by the constant use of four simple words: "I do not know," or of Louis XIV's favourite remark: "I shall see." If we swear never to surprise anyone into giving a decision and never to be hurried into forming rash judgment ourselves, we will have taken an important step towards Cartesian wisdom.

Haste is not the only cause of error; there is also prejudice. We approach questions with family and group opinions already formed; our disposition, heredity, and education have forcibly moulded our thoughts. If you wish to calculate the effect your group has upon your thinking, try to recall your successive estimates of Clemenceau, Caillaux, and Daladier after reading articles for and against them in your newspapers; you hated or adored—with good faith but not with good sense.

Our self-interest is another cause of prejudice. Pascal said that if geometry stirred us emotionally as much as politics we would not be able to expound it so well.



There are very few men who do not reckon the cost to themselves of a system of taxes before approving it. Imagine a doctor who has built up a method of treatment which enables him to make an excellent living and adds to his medical reputation; if he should discover that his method was based upon a false theory, would not a hundred good reasons occur to him for doubting the validity of the objections to it?

Everything that is in agreement with our personal desires seems true; everything that is not puts us in a rage. Consider the political life of Chateaubriand; during his exile he became, owing to the Revolution, a constitutional monarchist of the English variety. After the Restoration, Louis XVIII endeavoured to give France that type of government. If Chateaubriand had not surrendered to his personal feelings, he would have wholeheartedly supported the King's efforts, but he was irritated at not being himself chosen to direct the new Government. He developed a violent hostility to the King because of this unjust treatment, and he opposed his own doctrine with arguments which seemed admirable because of his gift of language but were actually odious. There is no absurdity or contradiction to which passion may not lead a man. When love or hate takes control, reason must submit and then discover justifications for their folly.

Some people believe themselves to be independent of surrounding influences because their lives have made rebels of them. But rebellion is not a guarantee of independence. On the contrary, it is an acute form of prejudice. The writer who has been too much dominated in childhood will put himself forward as a free thinker in his attacks on religion and family life, but his revolt is the revolt of a slave.



The author of *Le Discours de la Méthode* first advises us to keep our reason free from passion, and then to make good use of it. For this purpose he provides several rules: *Organize your thoughts in regular order, from the simplest to the most complex. Divide problems in as many parts as possible. Make your enumerations so complete and your surveys so general that you may be certain of omitting nothing.* This method has undoubtedly been of extraordinary service, first to Descartes himself, and then to the scholars of his day who later became experts in mathematics, mechanical engineering, astronomy, and in some branches of physics. The Cartesian method is still marvellously effective whenever it is a question for the mind, either of discovering its own laws, as in mathematics, or of studying the phenomena which abstraction or remoteness have simplified (as it happens in astronomy). It has seemed, not useless, but insufficient, when applied to the more complex sciences.

In many branches of physics, in chemistry, biology, medicine, economics, politics, the Cartesian method, though still a necessary check, does not make possible the solution of problems, and is not sufficient to direct our actions. How is one "to *organize* one's thoughts in regular order" when *time* is the main factor? How is one to "omit nothing" when the data of the problem are countless? The method constructs within us a microcosm of glass and steel whose exquisitely cut gears engage with perfect precision, but we know very well that the exterior world is not fashioned in the image of this exact and transparent mechanism. The windblown leaves, the storm-driven clouds, the labours of the fields and the passions of the city have no place here.

No reasoning, however well conducted and free from haste and prejudice, enables us to foretell, when we



look at an apple seed, what the shape of the tree will be, or the flavour of its fruit. No syllogism or theory gives us power to describe the disease that may attack a patient inoculated with an unknown microbe. Such questions must be asked of nature and not of ourselves. The method which, for two centuries, has given men such amazing power over the external world is a mingling of logic, observation, and experiment. Reasoning has a part in the method, but its conclusions will always be confronted by facts, accepted if they are confirmed by the conclusions and cast aside mercilessly if they contradict the reasoning.

The experimental method is sometimes attributed to Bacon. He was perhaps the first to formulate its principles clearly, but it was employed unconsciously in very early antiquity. Every savage made experiments without knowing it. Each one of us makes several experiments every day. This morning my study is infested by wasps. I try to discover the attraction. Perhaps it is these carnations on my table? In any case I remove them and in a few moments the wasps disappear. Verification: I get the flowers from the adjoining room and put them back on my table; the wasps reappear, and I have discovered one of nature's laws. I will see that flowers are not put on my table at this season of the year.

Reduced to its essential elements, the experimental method is a fairly simple one. It consists, according to Claude Bernard, "of systematically testing our ideas with facts." Man's observations suggest to him hypotheses based on the relations between phenomena. In order to verify these hypotheses, scholars make further and more rigorous observations. "The observer listens to nature," said Cuvier, "but the experimenter questions her and compels her to reveal herself." For example, he varies the cause and notes the variation in the effect. If he



observes a fixed relationship between cause and effect, the idea of a connection is apparently confirmed. However, error is possible. *Post hoc, ergo propter hoc* is frequently a false axiom. That a war breaks out after an eclipse does not prove that the eclipse caused it. There is the story of the Oxford student who drank numerous whiskies and sodas every night and could not think clearly. He gave up whisky and took brandy, then gin with his soda, but the effect was the same. "Undoubtedly," he concluded, "it was the soda." If he had been a wiser experimenter, he would have gone farther and tried the whisky, brandy, and gin without the soda; then he would have discovered his error.

The scholar is a man who, by means of observations and experiments, derives hypotheses from the constant relationship between phenomena. If his hypotheses are verified by every possible experiment, he regards them provisionally as laws of nature. Every time I let go of an object which I am holding above the ground, it falls. The rapidity of its falling can be calculated and the acceleration of its falling towards a given spot is constant. The existence, therefore, of laws regarding the falling of objects will be admitted. Science, which is the sum of such observations, does not in any way constitute an explanation of the universe; it is merely, as Valéry says, "a collection of successful recipes." But these recipes might fail. If I let go of the book I am now holding, and if, instead of falling, it should rise to the ceiling, I would be surprised, but science would not be thrown into confusion. It would merely be obliged to find a more complex law to account for the phenomenon.

Experimental science assumes but one metaphysical hypothesis: the stability of nature's laws. If we do not believe in nature's obedience, or seeming obedience, to



definite laws, it would obviously be absurd for us to observe phenomena. If water at the same pressure started to boil one day at  $50^{\circ}$  Centigrade, another at  $75^{\circ}$ , and another at  $100^{\circ}$  without our being able to find any way of predicting these variations, it would be useless to study physics. Happily such things cannot occur. Phenomena have a curious constancy. Why? Metaphysicians, theologians, and even mathematicians have some ideas on the matter. The experimenter knows nothing of it; he is not involved. He finds that the method of observing phenomena, deriving hypotheses from these observations, verifying these hypotheses by experiment, abandoning them if they cannot be verified, and regulating our conduct according to seemingly stable laws, the method which, according to Bacon, "masters nature while obeying her," has beyond a doubt accomplished amazing results.

Owing to its ability to establish constant relations between certain phenomena, which can easily be produced by human force, and certain others which require (if one wishes to produce them directly) more than human force, the experimental method enables man to become a superman. When a child sets all the mechanisms at an exhibition in motion by pressing a button, the action is symbolic of the power which science puts at the disposal of the very weakest of human creatures. Astonishing power! It is wonderful that a tiny insect of a man cast into the universe upon a speck of mud should succeed not only in measuring the distance from his own speck to others like it, but in changing its climate, its vegetation, and its animals within a few months. It is wonderful that he should have built machines capable of carrying him round his globe in a few hours, and that he should have conquered cold, darkness and famine.



Once again, the scientific method does not explain the universe; it will never explain it, but, considering the power it has given to men over physical, chemical, and even biological phenomena, it is natural that many should ask themselves: "Why should not an art of thinking, which has succeeded so well with the material world, be applied to human beings? Why should not the method which has made possible the construction of great factories where robots of steel and copper do the work of men, be used also to bring happiness to the men who have thus been replaced? Why should not the method which has created races of animals and varieties of flowers create also the superman?" When his children lost their tempers in a political discussion, Lord Salisbury said to them: "Let's try to think this out chemically." By that he meant: "Let's try to regard human substances as we regard chemical ones in an experiment. Do not attempt to foresee its results, but put the chemicals in the retort, heat them, and observe their reaction. If it proves contrary to our doctrine, we will abandon our doctrine." Scientific politics would be like that. Is such procedure possible? And does man find the last word of the art of thinking in science?

After several decades of high hopes—decades at the beginning of which Renan expected to find our world scientifically controlled by members of the Institute, and at the end of which Bertrand Russell imagined that a machine would enable us to know the exact moments of past and future events—we must realize, alas, that the experimental method, after having given us the amazing power described above over the external world, has produced very few good results in the domain of ethical, political, and social life. It is easy to understand why:



*Experimentation requires a closed process in which artificial isolation is possible.* If we wish to know under what conditions water will boil, we isolate a group of factors : source of heat, container, liquid; we apply a given pressure, and we succeed in removing most of the exterior influences. But no experiment of this kind is possible if it concerns complex human society where the isolation of a closed process cannot be managed.

*Experiments must if necessary be repeated,* and confirmed by both negative and positive ones. This is difficult in psychology; impossible in sociology. What rational statesman would try to suppress a whole class of society "to see what would happen"? What communist would agree, in order to make an honest counter-experiment, to the re-establishment of capitalism?

*Finally, the experimental method requires the good faith and disinterestedness of the experimenter.* These virtues, rare enough in scientific experiments of the kind not involving the most violent passions, become superhuman when these passions are aroused.

The scientific search for truth requires that reason shall never cling vehemently to a hypothesis. "If the first duty of a scholar is to invent a system, his second is to regard it with disgust," or at least to be indifferent to it. But a man is a man, and the desire to discover a law may lead the experimenter to tamper unconsciously with his findings in a manner favourable to the discovery. In medicine every specialist believes, often sincerely, that his patients are all suffering from the disease in which he specializes. The psychiatrist will say to you : "Almost all illness is psychic." The endocrine-gland specialist will discover a disease of the glands where a stomach specialist will find only ailments in his own province.

At least medicine is partly a science. It deals with



definite human bodies, which, if necessary during an experiment, may be partially isolated. But when it is a question of the reactions and the passions of millions of human bodies, as happens in economy and politics, the most contradictory theories may all be supported by facts. One can say that experiment has condemned the liberal economy of the nineteenth century since it ended by creating collectivism in our own time; but one can also say that experiment has condemned collectivism, because the latter, in order to save the society it conquered, was obliged to maintain or reinstate under new names the more or less classic formulas of private property.

Is it possible to base laws upon such experiments? Evidently not, for what makes experiments scientific is their great number and the possibility of repetition. In economy, each experiment requires several generations. The so-called Roosevelt experiment and Blum experiment are merely short phases of political evolution too costly to be set in motion voluntarily, too vast for proper observation, and too confused to have any educational value for future generations whose predicament will never be similar.

What is true in economy is also true in politics. We are told: "England has made the democratic experiment with favourable results." But no scientific deduction can be made, for other people are not the English people. Democracy is only a word beneath which must be written realities, and English realities are neither French, Spanish, nor Italian realities. English democracy implies English political life, the taste for open discussion and compromise, the intensity of local life, the understanding on the part of an open-minded aristocracy of the middle classes with whom it consorts freely, the agreement between Parliament and the *élite* of the land—in short, a constitutional monarchy.



To differentiate between democracy and fascism is to differentiate between two words, not two realities or two exact definitions. Between complete liberty and absolute authority, innumerable types of society are conceivable, and, in fact, realized. How is one to discover by experiment whether liberty is better than authority, when there is no means of calculating the degree of a nation's liberty? This does not mean that certain liberties are not desirable, that for a nation at a given time there are no political realities, but it does mean that these realities must be discovered by methods which are not those of science.

One ought perhaps to try to consider political and social problems "chemically", but it must be admitted that this would be impossible in the majority of cases. And that is why many men, so convincing when they speak of their own affairs, talk nonsense the moment they begin to discuss general principles. When an electrical system has to be repaired, the little world which represents it in the mind of the electrician constitutes such a precise map that he is perfectly at home among the wires and switches. But when a country has to be reconstructed, there is no chart of its social life by which we can lay a sure course towards progress and happiness. Though it be rigorously adhered to, the experimental method is as powerless as pure reason to guide a statesman, an industrialist, or the head of an army.

These men must nevertheless act, make decisions. Upon what are they to base them? Alain says, very profoundly: "Performance must precede volition." A puppy thrown into the water will swim though he has never swum before. He swims before he decides to do it. At birth we are all young animals thrown into the sea of things, and we swim as best we can. The writer, begin-



ning work on a novel, has no precise idea of what he wants to write. If he knew word for word, his novel would already be written. He throws himself into the water. Each chapter suggests the one to follow. Performance precedes volition.

To make plans is sometimes necessary, but the making of plans is not to act. Men produce admirable schemes : "If I were President of the Council. . . . If I were Mussolini. . . . If I were the Air Minister. . . ." To produce a scheme for perpetual peace? Child's play—and Wilson succeeded on the whole in doing it. But to maintain peace in Europe for two years, or two months? A superhuman feat. "Thinking is easy," said Goethe, "acting is difficult, and to put one's thought into action is the most difficult thing in the world." And Tolstoy : "It is easier to produce ten volumes of philosophical writing than to put one principle into practice." For the most part, in matters most important to our existence, we are obliged to find our way through an unmapped labyrinth of actions. What becomes of the art of thinking then?

We have shown the infallibility of instinctive thought and the narrow limits of its domain. The man of action dreams of discovering, in cases infinitely more complex, how to attain the sureness of instinct. In other words, for the man of action, the art of thinking is the art of making thought instinctive. We do not at all mean to say that the man of action should scorn reason. He must think out what he intends to do, envisage, like the young Bonaparte at Toulon, the problems which he will one day have to solve, observe many facts, and derive laws from his observations. But this meditation, these observations, and these laws must be inscribed within his



body. Thought must penetrate deeply and he must react promptly to its stimulus. For in this way only will he acquire the flashing rapidity of decision which events almost always require.

Consider an old physician at the moment when a patient is brought to him. Perhaps, like his confrères, he will require tests, and these tests will assist him in his subconscious reasoning, but his instinct, born of the thousands of cases he has observed, will dictate his diagnosis. His reasons for feeling anxious or reassured in regard to a patient are so numerous that he will often find it hard to put them into words. Beside some young and brilliant professor he will not seem to be very learned; nevertheless he *knows* and actually makes fewer mistakes.

The great general does no formal reasoning on the battlefield. From his knowledge of history, his experience, and from information received, suddenly comes the solution, and in Champagne Pétain repeats a manœuvre of Wellington's. The great writer revises a sheet of manuscript by taking out a phrase or an adjective, or by changing the position of a verb. If we try to explain why these corrections improve the passage we shall undoubtedly succeed, but the writer has no need to do this; he has acquired the instinct for language by long and careful study of the styles of the masters. "The essential thing," says Valéry, "is not to find, but to absorb what we find." Knowledge is ours only if, at the moment of need, it offers itself to the mind without syllogisms or demonstrations for which there is no time.

The microcosm, or interior world, for the great man of action, contains an exact replica of those parts of the outside world where his actions are to take place. A true statesman carries his country within him; he knows better than his prefects what the nation's spontaneous



reaction will be. He has acquired this complete knowledge of his people through observation, reading, reflection, and familiarity with citizens of all classes. It is expressed in the form of decisions that are quick and just. The politician who has no feelers will consult newspapers, statistics, committees; and with all this information will, oddly enough, make mistakes continually. Information is not culture. In the mind of a truly educated man, facts are organized and they make up a living world in the image of the world of reality. The statistician cuts up the world and kills it; the poet moulds a world and gives it life. The great man of action resembles the poet much more closely than he does the encyclopædist.

The profound meaning of the following famous sayings is now clear: "Man is stronger than he knows"; "belief must precede knowledge." We must believe before we know, because acts must precede knowledge. The art of thinking is also the art of believing, because no human being at the present stage of civilization could safely call all his individual and social beliefs into question again or submit them to his conscience. To change all one's opinions is a mental diversion which requires leisure for its indulgence. In order to live a life of action, man must accept most of the moral, social, and religious laws which have been recognized as necessary by his predecessors.

Our minds have successive coatings; the first is superimposed by the beliefs of primitive man; the next by Asiatic, Greek, Roman, and Egyptian religions; the thickest by Christianity and the thinnest by modern ideas regarding the structure of the universe. Of all this we are made: our works of art, our monuments, our ceremonies, our thoughts; and a man cannot free himself from the past more easily than he can from his own body. A sound thought is one which has its foundations deep in



the inner coatings of instinct, while its pediments and towers rise up into the clear, bright regions of the mind. It obeys the laws of logic which are its own laws. It observes, whenever it can, the rules of scientific research which have proved their virtues by their victories. It rests upon human traditions which survive in each one of us. Finally, it is a thought from the body and, as such, becomes action and poetry.

If I had to explain in a few words the connection between theoretical thinking and active thinking, I believe I would make use of the following comparison: in a battle, aircraft and infantry collaborate; aircraft go across the enemy's lines, observe, and reach likely hypotheses regarding its trenches. Aircraft must signal to infantry the direction in which advance seems possible, but aircraft cannot occupy the terrain; serious errors are often, of necessity, made in describing it which infantry will discover during its difficult advance. Infantry cannot fly over obstacles; it must destroy or surmount them, and some of these will seem infinitely more dangerous at close quarters than aircraft believed from their aerial observation. If infantry becomes entangled and blocked, the rôle of aircraft will be, not to continue a useless advance, but to maintain contact with infantry, realize its errors of observation, and find out how to render assistance. Then they will set forth again on reconnaissance, and the constant collaboration between the executants on the ground and the observers in the sky may lead finally to victory.

It is thus that pure thought can and must fly beyond territory already colonized by custom and observation, over regions that are still hostile. Interpreting signs by hypotheses, it describes what it believes it has seen. Then comes action, which attempts to occupy these regions



with the help of plans supplied by thought. Sometimes it succeeds, but more often it is repulsed. Thought must then admit its mistakes, get into touch with reality, and, renouncing the idle notions condemned by experience, suggest new hypotheses. It is only by means of the constant collaboration between reasoning, experiment, and action that we can achieve, not a permanent victory—such is not in the nature of things—but a moment of respite and repose beneath one of those fragile shelters which we call civilizations.

Is it possible to draw in our minds an exact map of the universe and to reach chosen ports? It seems to me that this question may be answered by saying that human thought cannot draw a precise map of the whole universe, that it cannot expect to attain the distant and mythical shores of Utopia, but that, like the navigators of antiquity who used the knowledge of their ancestors and increased it by observing the stars, the tides, and the winds, it can proceed courageously from shipwreck to shipwreck through many Ægean Seas. The wise Ulysses asked no more than that of the gods.

