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IN THE EVENING OF MY THOUGHT

IN TWO VOLUMES

VOLUME I



IN THE EVENING OF MY THOUGHT

LONDON
CONSTABLE AND COMPANY LTD
1929

IN THE EVENING OF MY THOUGHT

BY

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VOLUME I



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IN THE EVENING OF MY THOUGHT

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CHAPTER I

THE FLEETING MOMENT

In the evening of thought, when presumptuous life, its productive vigor exhausted, can but scatter to the winds its last and failing desires, comes the time when man stops in terror before the supreme question — less stupefied and shocked by the life which he has improvised for himself from day to day than overwhelmed by the imminent ruin into which the personality which so infatuates him is to fall.

What, then, is life? To have lived and died? First of all, what is it to be born?

Birth? A continuation — the continuation of an ordained interplay of energies in perpetual flux and change.

To live? The sensation of an imaginary permanence amid the elusive whirl of that eternal Wheel of Things of which India had the vision, only to feel an irresistible temptation to escape from it.

To die? To continue forever in eternally changing forms.

Man has come to understand that the words 'beginning' and 'end,' 'creation' and 'annihilation,' have only such value as any primitive presentment of the semblance of things has for the historian, and he has substituted for them a realization of the unbreakable chain of phenomena which represent only the activities of change.

Like the tides of the ocean, life hurls its waves at whatever obstacles oppose it, and, before the foam of hope has ceased to boil in us, its uncontrollable power, whose task it is eternally to give and to retake itself, ebbs away.

Can we change any part of life? Of what avail are all the ingenuities of language? Revolts or submissions are alike

written on the sands, merely to become the playthings of the wind. And yet, in this infinite universe, to feel that we have filled the fleeting moment with our existence, is surely something.

Something! Can we offer a man nothing more tangible to reward him for a rough voyage through life? We should meet a better welcome, no doubt, could we open to him the vista of a 'paradise' of unending felicity. Pleasant as such an aspiration might be, in view of our ancestral mediocrity, it would hardly be sufficient to bring about the desired reality.

Superior to all other living organisms, we find ourselves in a position which, although modest, is not to be despised. Pessimism and optimism are words which correspond to no sequence of phenomena, since they presuppose a world subservient to the ends of human destiny when, on the contrary, man is subservient to the ends of the universe.

Phenomena, to be sure, exist. And man, who is one of them, must reconcile himself to the fact. Whether he complains or rejoices thereat, the adventure of his life has the same relative value to the whole as any other organic or inorganic activity of the infinite world.

For better or worse to appear as an individual — in other words, as a unit of homogeneous phenomena temporarily combined — is nothing more than the stroke of luck that wins the grand prize in the eternal lottery of things. Life is an incomparable privilege (capped by the sovereign power of leaving the stage at the fitting time) even for the man — struck back into the abyss from which he has momentarily shot up — whose hereditary fate it is to be unappreciative of his good fortune.

If such be the case, what would we consider a gleam of pure human joy? The blossoming of an ephemeral consciousness in a passing breath of eternity? The proud acceptance of the inevitable, a supremely serene acquiescence in the incomparable good fortune of having been?

Between his first breath and his last, man, though under the cross-fire of ingenious questions and the dogmatic re-

plies that his stammered doubts receive from oracular ignorance, has ample time to adapt himself to life without too many surprises. Oracles of the Master, oracles of the Book, all the formulæ of Revelation, at first need do no more than keep pace with successive misconceptions.

The supreme drama of life, with its alternating moments of heroism and of failure in the daily battle, is but a winning beyond this outer wall of 'knowledge,' and a measuring of ourselves with the yardstick of our will to achieve. Read the story of those who have dared. Compare with that story the peaceful atrophy of those who bask in the charm of fairylands easily accessible to childishly emotional minds.

Meanwhile, life devours the passing hours — which the world seems to consider as a running account — until the date of payment unexpectedly comes, and we must settle for items which have become meaningless to us. Men who have withstood the many buffetings of life without faltering, but also without looking beyond, are panic-stricken, and tremble at the restful vision of the release into forgetfulness.

Suppose they had tried to find out? No; for they dared not take the risk of knowing! Too long did they reject the 'satanic' suggestion to comprehend; and they cursed, persecuted, and tortured those who came to offer an answer. They preferred to align themselves, like a queue at the box office, waiting to see a drama of heaven, the fantastic scenes of which seemed to them all the more marvelous because each of them could hope to get no more than the satisfaction of an elaborately staged dream devoid of all reality. And yet, as the moment of anticipated joy draws near, does not each one, for some unknown reason, use every effort to postpone the raising of the curtain? What a confession!

However, there have always been men, 'armed in triple bronze,' who have never feared to confront the universe with questions which have been more or less specifically answered. And even had their questions remained unanswered, theirs still the merit of having asked! But they have not failed. Fearless of punishment, untempted by any hope of recompense, they gave the best of themselves to the disinter-

ested work. Through their efforts, life has been able to shoot shafts of knowledge toward the elusive unknown, and has made the very spheres of the 'unknowable' reëcho from the blows. Is not this world of ours ultimately going to free itself from the domination of those who have been shipwrecked on the absolute? Is not relative knowledge enough for our brief lives?

How can I evade the problem of who I am, whence I came, and whither I go? What am I doing here? What is the meaning of the articulations of a particular personality with whose activities my every sensation is linked? Why the thrills that make me tremble? What relation exists between my own thrills and those of the world in general? Where shall I seek an explanation of this life of mine, imprisoned as it is in unknown elements? Is death escape, or merely an exchange of prisons?

All my life I have lived on noise, and now I hear the muffled tread of silence. Before I forever hold my peace, what last words shall I utter? Is it wisdom or folly for me to speak? Is it not too often the lot of man to talk before he knows whereof he speaks? When the time for regret shall have passed shall I not, sooner or later, be faced with the same alternative?

Amid the universal tumult of egoisms, when the eternal void is drawing near, why should there be no farewell testimony of past experience — something in the nature of those piles of weapons which, in Greece, conquerors and conquered left on either side of the battle-field as a hasty testimonial that strong-willed men had passed that way? At Chæronæa, a battle which marked the end of an incomparable era, you can still see such piles, and still read their lesson.

At dusk, stiff from the effort of the last furrow ploughed, the laborer straightens his tired back. Where shall I find the share to plough the furrows of the universe? What grain shall I sow? What harvest shall I reap?

I gaze about me and, at first, I am seized with a desire to see everything. I look forward eagerly for whatever may

happen, whether good or evil. I vibrate to every passing tremor — harassed by ignorance, dazzled with sparks struck from the clashes between a visible world which eludes me, and an unknown one of which I am a part.

Clouds flying overhead now veil, now reveal the pale stars, beacons of a shoreless sea unfathomed and unfathomable. A shaft of light pierces the darkness, passes, and leaves behind an even blacker night. The earliest mariners did not wait to discover the compass, for the spirit of adventure preceded any compass. As Noah, on the crest of the flood, sent forth his dove, so questioning man gives flight to his winged queries, and eagerly scans the horizon for the returning answer which does not come. Man seeks to still the emotion stirred in him by himself and by the world. Is he to be forever lulled with soporific rhythms? How can the vigor of life exist in torpid and incipient thought? The sorcery of harmonious words may charm the first hour of awakening. Yet we are driven on by the necessity of action. Shall I buzz in empty air, or shall I enter the ordered development of which knowledge shows me to be a transient episode? How shall I deal with the shocks of the unknown which, coming to me from inaccessible space, penetrate the deepest recesses of my being, and seem to reach even deeper?

I crave knowledge so that I may live as fully as I can, even to the point of exceeding my powers — at least in imagination. Poverty and greatness, extremes of the fluctuations of our experiences — what may they teach us? How and to what end shall we make use of them? To outgrow our suffering — is not that what we hope of to-morrow? If the heavens hold the secret of a lodestar of human intelligence, where and how shall I find it? In the mean time I am no more than a thing among things lost in the indifference of the universe, and, bewildered by the world and by myself, I am trying to find my bearings.

Should I not, perhaps, understand the haunting thunder of the sea? Have not these hot surges of joy and of anger a hidden meaning? What hints are to be found in the

flowering fields of the earth, or in the shroud of its ice, or in the threats of its tempests? What does a storm express? What has a calm to tell? Around us is a seething mob of men striving to live in spite of all manner of opposition. What chains bind me to all this? What is this pitiless sheaf of better and worse, of many joys and many woes?

Will it not speak, this phantasmic vault that simultaneously offers and refuses answers in which I find only unfathomable problems? Whither do these twinkling stars, go-betweens of time and space, invite us? What end will this sun, so free to promise, so prompt to deceive, make of us? Does not its fire contain the secret of the future? Among the windings of the labyrinth, where there is no turning back, is there, or is there not, one which will lead us out? Why and how lay hold of a succession of isolated acts, which are perhaps only volitions?

Volitions! The mob pricks up its ears. How, in the impenetrable confusion of the world, can the mob explain what it has as yet been unable to unriddle more simply than by assuming a play of volition like that from which flow its own personal decisions? Why should not the universe, like man himself, be simply a succession of volitions superior to his own? If that were true, man and the world would find themselves understood before they had been studied. How fortunate it would be were there an Unknown whose personal actions were the result of reactions corresponding to our own! The existence of such a being would explain and rationalize every event, no matter what!

Thus, what we least knew we should understand best. Some day we shall perhaps determine whether the Unknown is a unity, or whether it is made up of separate powers. The most plausible and safest notion of the Ego is to assume it to be the dwelling-place of the human will. Must it not be the same with the activities of the exterior world, which, like ourselves, are now united and now opposed, according to unknown determining forces? What dazzling simplicity! Were that so, the voice that we awaited from exterior things would have come from ourselves. Subjective volition, ob-

jective volition! Like grass in the wind, the fate of the weak is to bend. The luminous vault enforces its decrees by thunder and lightning. Whoever seeks to tempt us with the torch of verification is hidden in its smoke. All questions would be answered before they are asked. The voyage to circumnavigate the sea of knowledge would be completed at the very moment of its start.

Do we need the proof of unimpeachable testimony? Remember that on a certain day, no one knows when, no one knows where, a voice was heard saying: 'But the tree of the knowledge of good and evil thou shall not eat of it, for in the day that thou eatest of it thou shalt surely die.' Man disobeyed, and the story is familiar. And from that time ignorant visionaries had the task of repressing the revolts of those who, flouted by man and by the deified elements, tried to know. Thus the cult of the Unknown, powerfully endowed with life and solidly established in the primitive fogs, held the worship of the groping masses through the potent catchwords of authoritative utterances.

Whither does the tragic adventure of man, always struggling against himself in his effort to understand his life, lead us? If we are content to beat our wings against the gates of the mystery, what can we expect from the echoes of infinity? Can we catch some glimmer through the gate of Logari, carved in the rock of Delphi to represent the threshold of Hades? Time alone can tell, and yet enough time should have elapsed since the tragedy of Eden to permit us to form some opinion of the efforts on either side. We should be able to draw up a balance-sheet of each man's thoughts before he quits the stage, as a sort of justification for his unexpected passage through life — something like a valley of Jehoshaphat of the knowledge he has gained. In many cases the account would be short, since, generally, men have merely accepted automatically an authority that permits of no questioning. For superior minds, it will be the sorrowful story of the scientific spirit tossed on the waves of ignorance. Galileo, take the witness stand!

'Why do I offend no one,' a philosopher asked, 'if I ques-

tion the postulates of Euclid or the law of Mariotte, but am shouted down if, seeking the absolute like every one else, I fail to find it?' Why is it that the effort of human knowledge clamors for nothing so loudly as for experimental proof, whereas the divine reply to our timid questionings is a sentence of death, rounded out with the torments of eternity?

The scientist invites contradiction; the pontiff has but one governing principle — the destruction of heresy; that is, of any opinion opposed to his own; and primitively emotional minds escort him with much pomp. 'Sancta simplicitas!' cried John Huss, as he saw a little child fetch fagots for the stake at which he was suffering martyrdom. Show yourselves, then, in the full light of day, all you who are eager to replace the labor of knowing with the magic amulet of words, and thus to end human exploration of the rugged path of scientific observation! Let the sinister coalition of feeble thought, of weak character, of slavish imitation, of the blind urge of organic atavism, of the furies of disguised self-interest — universal league of all failures, banded together for the sole purpose of forcing human reason to abdicate — let it, I say, appear in the light of noon!

We join the parade, for it is as much as your life is worth to stand aside as the mob sweeps by and not to join its ranks. Scientists of unquestioned standing manage as best they can to pass from 'the laboratory to the oratory,' mystically reserved for the hallucinations of the unknown.

Pascal, loyal to himself even to the verge of aberration, will ever remain the grievous example of a tortured conscience in the grip of an unutterable doubt, which he wished at all costs to repress. Before he could accept the last desperate argument, namely, that God is a good bet — must he not have reached the limit of his power to believe? On the day when that fate befell him, the blind leap he made in hope of assimilating the absolute merely left him exhausted — why, he could not tell. The mental torment which his doubt caused him was intense, even before he expressed his suffering. By going to extremes, he had reached that

dangerous conviction of man's intellectual helplessness into which empirical thinking on dimly perceived probabilities is sure to flounder. If there is a god, my chance will be as good as the next man's; if there is no god, I shall have no one to complain to. Who dares affirm that those assertions of faith which men have glorified in noisy tumult have not at bottom been tinged with some such unspoken thought? Much clamor about heaven, supported by the largest possible crowd! The idea seems to be to live the average life of the average man without giving to our personality a troublesome sharpness of outline, and to go as far as possible with puerile pretenses — avoiding the profound gift of ourselves. What bubbles of the iridescent foam of nothingness!

If we were to revert to scholastic wrangling for the sake of logical acrobatics, we should get no farther than the common metaphysics of bygone times. Men tire of the hollowness of formulæ mechanically repeated for some thousand-odd years. The frail dialectic against which our syntheses of observation bring up short can no longer throw any light upon the vast struggle of consciousness seeking to find itself.

Well, then, what solution am I rash enough to suggest? Simply to draw up a balance-sheet, such as a man of ordinary cultivation can to-day prepare, of our positive knowledge of the world and of ourselves, amply annotated with theories and even with hypotheses still undergoing verification. Now and then, perhaps, a far-off light will illuminate the path as does a searchlight. I am not trying to be didactic. I merely suggest that we take stock of our mental inventory as a means of checking our intellectual state of mind. I offer methodically compared inferences in the field of inductive experiment, with a view to binding all the parts of knowledge together into complexes of fact.

Not that I dare expect to quiet the eternal dispute. Our waverings, our doubts, come from such depths that they will probably survive in many different forms until that uncertain day when man by his own effort shall have graduated

from the present stage of his evolution. I see too many indications that I shall not live to behold that wonderful day! Nor will you any more than I. Meanwhile, what nobler form of 'self-examination' can a man undertake than a scrutiny of his 'knowledge'? It is the supreme effort of man's personality in a field enlarged by evolution to the point where he can examine himself and judge himself.

The psychological interest of a life lies less in its exterior acts of calculation or in its manifestations of feeling than in the correctness or incorrectness of the forces which direct its coördinations. Let us tarry at the deep spring rather than at the common drinking-place. Let us seek the truth about man independently of fictions which befog the issue. Let us seek what is rather than what is not. We must choose between planetary life in all the forms that experience reveals to us and the magic of ceremonies designed to enhance incoherent hallucinations.

Well, yes, the ceremonial, for it stands at the crossroads of emotion and thought. In the relations between man and his deity the personification of the Unknown involves the conventional reproof and propitiation. And most of the faithful soon come to see their 'religion' rather as a form of words than as the strict practice of the precepts of mutual help — a practice, furthermore, that for eternally selfish ends assumes the ingenuous likeness of a bargain. People will not agree with me, I know. Nevertheless, compare the pomp of sacerdotal ceremony with the too obvious inadequacy of the universal maxims of charity, the happy effectiveness of which, however, increases with the growing skepticism of modern society.

Throughout the whole length of the triumphal way the sumptuous pageant of man's inherited emotions, ever renewed, progresses grandly to the rhythmical chants of praise played by the trumpets and under the iridescent banners that flank the plumed daïs. Processions of emblems and images — that is, of fictions — unfold their splendors amid the smoke of incense. Can one imagine a deity delighting in such tinsel? Furthermore, the splendor of the procession is

only intended to dazzle the childish enthusiasm of the populace. I do not know whether to be proud or ashamed of the fact, but I, too, am one of the crowd. Yes, even I. And since you invite me to stand gaping at your mystic treasures, may I not ask myself from what die they are struck? 'Universal truth,' you say? Why is it that, wherever I go, I find another dogmatic truth that is no less universal than yours, and nevertheless different from it? Is not the only universal truth that truth of human relativity which has been won at such cost, but which in the end has been accepted by every person in every land?

You bid me hold my peace? Can your deity prevail over us only if we remain silent? What means do you propose to keep men from thinking? In that attempt, at least, the infallibility of the priesthood has proved itself only too fallible. In spite of the terror of the fires of your stakes, men have spoken. From them we have learned something of the world and something of ourselves. The time of polemics has passed. To-day a brief recapitulation of the tested and proved knowledge we have acquired is enough to allow the man who thinks to displace the man who dreams.

In every age we need to recapitulate our knowledge. The spread of doubtful knowledge, correct or incorrect, robs the intelligence of its means of coördination and of its bearings in the somber forest of the inexpressible unknown. The most superficial bit of observation needs to be corroborated by another, both to prove it and to be proved by it. An isolated bit of knowledge is not knowledge; in the encounters between man and the world it is not, it cannot be, more than a useless flash of unutilized sensation. From the very beginning, there has been a tendency among primitive men to pool their sensations in order to deduce the common coefficient. And when some treasure of approximate information could be combined into a generalization of doubtful soundness, the idea of a 'general truth,' of a 'universal comprehension,' impressed them as a supreme victory — as a taking possession of an unknown environment.

Doctrines based on chance conclusions have thus sprung

up amid conflicts in which fancy and observation still dispute the field of human knowledge. The tragic history of the struggle between those two faculties — a struggle to which there will never be an end — makes the fascinating but cruel argument of the drama of our thought. As we were being swept along by the torrent of things, research offered us the temptation of a schematic resting-place from which we could obtain a comprehensive view of the universe. It is the usual contention of philosophies and of religions that they offer such a resting-place — a contention justified in so far as the philosophies and the religions attest ordered intellectual effort, erroneous when they aspire dogmatically to establish permanent structures on weak foundations.

Often in peril of their lives the greatest minds have successively offered us every proposition that fancy can suggest bearing on the relations between the infinite Cosmos and man, who is its fleeting product. It seems, indeed, as if everything had been said which can be said on the questions that have been summarily solved by the magic of words. However, after thousands and thousands of years — the exact number is immaterial — the matter is again revived by the necessity of differentiating between dream and thought, between the enthusiasms of an unbridled imagination on the one hand, and on the other an experimentally fixed classification of relations based on the law of causation.

To establish that distinction is the problem of modern times. When the ancient sages of India gave us philosophies that we have not excelled, they merely spoke according to their convictions, and prophesied since they could not speak from experience. The same defect characterized the Roman Hellenism of Lucretius, which sought 'the nature of things,' by linking together truths which he anticipated and which observation later confirmed.

What our acquisitions of experimentally verified knowledge have given us in modern times under the general name of 'science' has surpassed all expectation. Have we reached the point when we can bring the things we know

face to face and test them one by another, and so bring out the primary outlines of an harmonious whole? That is the question I am trying to answer by means of a succession of brief, properly coördinated expositions.

The notion of an epitome of knowledge dates from the time when man began to think in general terms. How is it that those general attempts have multiplied indefinitely in all lands and in all ages, and yet have never reached a common foundation on which men could definitely agree as a starting-place and from which the human mind might begin a forward march toward verified knowledge? The reason lies in the unknown element of the objective values which must be accepted if a general agreement is to be reached. In those ages there was no rule of thumb by which to distinguish dreams from thoughts. The result was that man was simultaneously offered, as methods of learning, prophetic intuition and verified experiment. Necessarily these two are mutually exclusive. The decisive progress of modern science has finally brought about a total revolution. Experimental proof is established as the only criterion of settled truth.

Not that there can be any question of giving to positive knowledge an absolute value such as is given to dogmas devoid of any foundation in fact. Our dogmatists say that the relative nature of our observation puts us out of court. Such is the pleasant vanity of the self-styled possessors of an absolute truth who neglect the experimental corroboration of tangible proofs. They assert that they know the world in itself, but no testimony in the nature of a verification of that assertion is forthcoming. We have seen in the trial of Galileo what happens when science and dogma meet face to face. True, we do not pretend to more than relative knowledge. But in our reliance on experiment we hold an impregnable position, since observation, if caught tripping, can be set right by the acquisition of new facts. Where, then, is the proclaimed 'failure'? Is it on the part of the condemned Florentine, or on that of the judges who were forced to reverse themselves?

Positive knowledge has at last broken through all the

limits within which dogma sought to contain it. It has taken possession of all free and of all restricted domains. It forces itself on no one. It offers itself to those who are worthy of it. Its characteristic method is to proceed only with the point of doubt which blazes the trail from the knowledge of yesterday to the knowledge of to-morrow. 'You doubt much,' wrote Voltaire to M. des Alleurs, 'only because you think much.' Excluding all doubtful points, we still have such a capital of provisionally verified knowledge that the day will soon come when we shall need to draw up a consolidated balance-sheet of results. That is what Saint Thomas tried to accomplish in his 'Summa Theologiae.' It is the task that to-day has fallen to each one of us; we must take it up again, no longer basing our work on the data of religious metaphysics, but on all the experimental ideas that have been scientifically and finally verified.

That was the controlling idea of Alexander von Humboldt when he undertook to explore our planet in order to reach general conclusions in regard to it. Scholar, philosopher, even poet, he had every qualification for the work. With bold strokes he painted for us magnificent pictures in which man was drawn within the frame of his 'Cosmos.' Having promised us a 'physical description of the world,' he included man in the place to which fact assigns him.

Whatever progress knowledge may make, the materials of scientific observation can but increase in number and in quality, although the distance that separates us from the inconceivable absolute will not be appreciably lessened. It is only a question of following into the uttermost recesses of an ingenious elaboration of 'knowledge,' which man began the day when he dared put those first questions about himself and his environment which revealed some relation between the world and man. At that time as to-day the answer he could give himself was merely commensurate with his own ability. And then, from day to day, as the questions were eternally reconsidered, the replies followed one another according to the newly acquired information, remaining always subject to revision in the light of new information.

The peculiar characteristic of my attempt at a constructive description of scientific knowledge is that I follow no system, no plan of preconceived doctrine, that might unconsciously lead me into premature and biased interpretations. I have no personal views to substantiate by prejudiced opinions. I try to correlate a mass of acquired knowledge which, when reconciled, is enough to erect the framework of an intellectual structure which, owing to our relativity, we shall never be able to complete. My inevitable errors can in no degree change the character of my enterprise, since they can but bring about, in time, a better adjustment of the material to the desired end. The knowledge that I have acquired limits my interpretations, but cannot decrease for me the lure of the Unknown.

Hypothesis becomes knowledge, and human knowledge will always contain an amount of unverified theory in which the starting-point for new knowledge can be found. Thus it will be our privilege to erect from day to day fragile shelters of understanding which every hour will strengthen, and which will allow us progressively to adjust ourselves to the world, instead of driving us mad when the world does not adjust itself to the dim ancestral misconceptions which our intellectual torpor lazily accepts.

CHAPTER II

THE WORLD AND MAN

?

FROM my sandy terrace, when under the light of the stars I hear the soothing invitation of the sleeping ocean, I can see in the fading light the mists of heavenly dew settling down. Verdant or parched, the motionless earth expectantly offers itself to the decrees of the inevitable. The heavy silence of planetary inaction burdens me with the obsession of a happy dream, accompanied by the rhythm of the ocean's lullaby, now and again ending in voluptuous plaints. It is the cosmic struggle of man proclaimed in the eternal opposition of shade and light contending for the joy or the sorrow of our sensibilities.

The dim sky grows light. With a tenuous streamer of 'its saffron veil' the dawn writes on the dim vault of heaven the first sentence of a newborn volition; an anticipation of something that is not yet, and that as soon as it is will be no more. Then what? To the cadences of day and night, the rhythms of sleep and waking eternally follow each other in fleeting sequence.

The world waits. It seems as if nothing were happening. However, slight shudders warn us that an event is taking shape. In the heart of the invisible I know not what beginnings have been made, or how they are divined. Yonder, beyond this night of mine, the rising sun follows its irrevocable course, vivifying as it passes what was lately but darkness, only to forget as quickly the day that is to come. Elusive lights lavish on all sides the seduction of their first smile. Luminous tangents from the flaming sphere send rays that from the celestial vault to the depths of the ocean illuminated before sunrise are changed into reflections of reflections. The imperious beams of the lighthouses have grown feeble. Soon insensible shades of light and streams of radiancy will gleam, will succeed one another, join, brighten,

fuse, be renewed unceasingly, until the celestial fires flare crimson.

Color! At last, here is color breaking through the last screen of ashen gray, infusing the tumult of the scene with dazzling fire. The pale field-poppy of the dunes and the soft sea-green of the marine purslane send forth their fragrant invitation. The insignificant everlasting offers its deceitful gold. The spider has woven its lacy trap over the stiff heads of the broom. The little white snail hoists himself slowly along the twigs to complete the bouquet with an even whiter flower. The lark flutters singing in the heavens. From the mass of molten iron volcanic lightnings flash upon the reddening sea. And all that transformation of night into day, of death into life, has taken place without my having been able to detect at any moment the transition between the phenomena that together form a pageant which always invites me and always eludes me.

Hold. It is the rush of energy. The world unfurls its pictures overflowing with life. But only for a moment, for almost at once the mists of twilight begin to soften the sharp outlines of the light, and while you are vainly seeking to separate the fused mirages, the red glow of sunset, spreading insensibly, announces the return of night. Such is the eternal hurry in which is made manifest the unalterable relation of one thing to another. There came a day when the fall of an apple brought in the case of Newton, as the oscillation of a lamp at Pisa brought in the case of the Florentine martyr, a most important problem to the verge of solution. The sights I see from my window present all the problems at once. Can men ignore them or deal with them by pretermission by consigning the universe to some eternal genie who, failing to hit on anything better, is supposed instinctively to have made everything that we see?

Much has been written on the beauties of Nature. I have sometimes wondered whether that very abundance of books may not too often have led us away from silent meditation.

Amazement remains one of the keenest reactions of our sensibility. Yet it would also be advisable to know how far we should allow ourselves to be carried away. We should look, not so much to be dazzled, as to see. The sensorial image reveals only the superficial aspect of things — things so familiar that we pass them by without stopping to analyze them. As our intelligence develops, it makes an effort to go beyond the reactions of primitive sensibility into the realm of established facts. To-day we try to join to the emotions that things evoke — a field which our knowledge cannot fail to widen — an understanding born of experience which will reveal a universe far grander than imagination has painted.

The world and man stand face to face. What about them? Can we grasp them? And how? What current of influence flows from one to the other? This complete jumble of things must be made clear. What methods have we of approaching the unknown? And for what purpose shall we approach it? In the inexpressible emotion which immensity, both attractive and repellent, stirs in us, these questions present themselves to the perplexity of barely formed minds. What shall we do about them? Where can we find the secret of the elements? And, if found, how make it lead us to our proper place in the pageant of the infinite Cosmos?

To-day we can discuss the mental shocks descriptive of the perplexities of our ancestors which, though they may change in appearance, will never depart from us. That permanence of the more or less rational emotions which contact with the elements awakens in man, is our outstanding characteristic, although we are alternately carried away by the fury and the charm of an inexpressible tumult of emotion which drags us along, we know not how, we know not whither.

The enigma torments us not only because its problems are so complex, but because our premature solutions are of such dubious accuracy. Following in the train of the symbolic Œdipus whose search for knowledge cost him so dear, all the masters of human thought have thrown themselves

into the adventure of a search which has no end. There has been no lack of enthusiasm or of courage or of persistence; and what bursts of sudden light, what clouds of obscurity there have been! Is it surprising that 'dogmatic' truth, so painfully acquired, should have been transmitted from generation to generation as 'without error,' only to find itself too often unable to keep the promises it so loudly made? In every age, in every land, 'absolute' truth gives no more than the hollow satisfaction of words. And relative truth is so insignificant in terms of infinity that we dare not expect of it that flood of enlightenment for which we have hoped and for which we shall continue to hope.

Is there no Ariadne's thread to lead us through the confused terrors and hopes of this labyrinth? Where can we grasp it? We have always believed that we held it; and it has always snapped between our clumsy fingers. Is that to be forever the lot of humanity? Or can we conceive that, misled by our visions of the absolute, we shall regret finding only coördinated, relative truths, with no other magic than the simple offer of themselves, to point the way to verified explanations of the progress of the universe of yesterday to the universe of to-day, which in turn will determine the progress of the universe of to-morrow?

To choose between the two, stoutness of heart rather than intelligence is the prime requisite. Whoever feels himself unworthy of the enterprise, let him renounce it lest he founder. Whoever asks of man only the beauty of an effort to understand must, in a spirit of mixed rashness and prudence, dare to lay hold of the mysterious folds of the yet unlifted veil of Isis. Exhausting labor day after day, too often found to have been futile, axioms born of hereditary ignorance, primitive ingenuousness surviving its senility, sanguinary conflicts perpetuated through the ages for the sake of varying opinions — those are the things that await the bold seeker after truth. He will have a life of perpetual trials, whose sharp edges may be somewhat softened, perhaps, by the anticipation of eternal peace. *Fata viam invenient.*

FROM MAN TO THE WORLD, OR FROM THE WORLD TO MAN?

If we work up the atavistic stream, we quickly perceive that the problems of the world and of man could not have presented themselves to our remote ancestors in the same terms or in the same forms in which they present themselves to us to-day. Dimly felt empirical questions that for primitive man, as distinguished from the animal, were urgent could elicit only such answers as were commensurate with a wholly untried 'understanding,' seeking blindly to adjust itself to the world. The first step leads to the second. Such is the sequence of the successive stages of our evolution which is about to begin and which is to continue from the moment our sense of the relative becomes active. At whatever stage I consider primitive man I discover elements of the man of the future — but elements still powerless to develop themselves. A transition from complete weakness to some degree of strength sums up our life. How can we understand the course of that growth if, as is done in the Bible, we attribute to primitive man all the mental characteristics of present-day humanity?

No. The questions with which we are struggling to-day did not present themselves and could not have presented themselves in the same terms in which they present themselves to-day, nor did they have the same bearing. We must surely go back to the problem of origins, for the answers which would have satisfied primitive man necessarily included the questions that were bound to follow if there were to be logical series of explanations applicable to the earlier stages of knowledge. Here I simply point out that the questions suggested by the first stammerings of man's ignorance were what started our ancestral sensibility along paths in which imagination did not as yet have to struggle against the curb of verified facts.

I say sensibility because, biologically speaking, it is the first reaction of the organism brought into contact with externals. But let no one assume that the human organism of the quaternary age possessed our capacity for sensation. To cite only the most notable of our mute ancestors still

governed by animal instincts, the man of Chapelle-aux-Saints, before reaching the point of asking questions, doubtless felt amazement very different in form and in degree from any amazement which we feel to-day. That is a far cry from the dramatic picture of the human soul gushing from the 'Infinite Power' as its sole parent.[1] Let us leave this idea to preachers and simply remind ourselves that if from quaternary man to Newton our knowledge of the universe has made some progress, we perhaps have some reason for not adhering to the ignorant cosmogonies in a spirit of theological bewilderment which denies all need of scientific explanation.

In order to enter more thoroughly into the problem let us first ask why the primordial question had to be inaccurately framed. In our investigation of the mind, should we proceed from man to the world or from the world to man? That is our first problem. Our primitive ancestors had no choice between those alternatives. The vaguest consciousness of themselves was enough to enable them to see things objectively and to demand of them an accounting at the tribunal of their personality. The Cosmos, wholly indifferent, appeared at the bar and was not disturbed by the responses that the judge was pleased to put into its mouth. What relation could that procedure have with that of subsequent scientific observation, in obedience to which we seek the permanent laws of the universe so that we may adapt ourselves to them?

That was the age of elemental anthropomorphism, and

[1] Plato, who had great imaginative power, supposes the case of a man born in a dim cavern, and being then suddenly brought into the full light of day. Any one can guess how vividly Plato describes that man's astonishment in order to justify himself in attributing to him such a conclusion as: 'Yes, there are Gods, and these great things are their handiwork.' That exclamation, if it were uttered, could be nothing except the result of the total lack of observation postulated by the philosopher. As from the first we have lived a life of uninterrupted familiarity with the sights of the earth derived from our inferior ancestors, Plato's hypothesis is untenable and, since the cause is absent, the effect vanishes. Who could specify just when he discovered the sun? The time for exclamations of wonder will come later, but in very different circumstances; only under the guidance of despised experimentation shall we attain it.

necessarily so, for man could not do otherwise than appraise everything in relation to himself until the day came when long-continued observation taught him that contrary to his previous belief he is not the parent of the universe, but its offspring, and that he must adapt himself to it. Mistaking cause for effect is a grave enough blunder. Shall we ever learn to avoid it?

Descartes asserts that what we know of the world comes from ourselves. Strictly speaking, that is putting the cart before the horse. What we know of ourselves comes from the link between our individual activities and the cosmic activities of which our Ego is the ordained product. We cannot contain the world that contains us. On the other hand, elements of cosmic manifestations leave their mark as they pass across the sensitive plate of our nervous systems, which is the receiving surface of certain aspects of our individuality. The images of the phenomena of the world reflected in that mirror, when properly assembled, will allow us to coördinate the rapidly moving pictures in which the syncretism of the Ego plays so prominent a part. As we progress towards knowledge we shall find ourselves drawing farther and farther away from the Ego (it cannot be otherwise), but we shall discover its very fountain-head when general phenomenology has brought us face to face with it among the activities of the Cosmos. We have the telescope; let us look through it for signs that will explain the universe and ourselves, since we are cosmically and elementally linked.

It is we who reflect the interplay of relations, the classification of which makes our knowledge, and in that very interplay we find, experimentally, our place in the whole. Hence we must conclude that the universe is in us, since it is ourselves that we find in it. Is it not then a very beautiful thought that our sensitive surfaces allow the activities of the Cosmos to be registered, to be known, and to become thought in sensitized man?

THE SPECTACLE

Barring a few catastrophes, the planet was yesterday what it is to-day. 'Creation continues,' said Philo the Jew, and in this modern science confirms him. We shall see what happened to the much-discussed theory of the revolution of the globe as Cuvier conceived it, and which gave him an excuse to rush to the rescue of the Biblical Creator, whom Lamarck had put in a difficult position in the matter of the succession of living species. Our men of the quaternary age (since we cannot yet make out the state of tertiary man) must, like their proximate or their remote ancestors, have at first been wholly occupied in looking about and feeling. However, to look is not necessarily to see, and still less to observe. Throughout the animal series we find every degree of sensation, observation, knowledge, or misconception, accompanied with such differences of insight as the length of apprenticeship (Lamarckian habit) may determine. Even in the case of the individual, identity of organic formation does not necessarily imply an identical functional activity throughout each period of evolution. The practiced eye of the savage has a delicacy of perception that is beyond us; on the other hand, should we lead the savage through the museum of the Louvre, we should be able to teach him something new in the art of seeing.

Before primitive men could be intellectually astonished enough to ask questions that had never occurred to their forbears, they, with the animal habit still dominant in them, needed first of all to pass through a period of evolution before they could know themselves or reach the status of 'the thinking man.' The sights of the world produced on their retinas images analogous to those which the same sights produce on ours, but not yet could they draw from them any but the most sketchy explanations — a difficult argument for the persons to meet who even to-day claim that the generalizations of primitive man are still valid, although the stage of organic sensibility which produced them no longer exists. Primitive man, whom we have seen fit to dub 'old,' can invoke ignorance as his only authority,

whereas we, the men of to-day bowed with the weight of all antiquity, represent all the evolutions of the past. 'They whom we term oldest are, indeed, the youngest,' as Roger Bacon has it.

These are my thoughts as, buffeted by the wind, I wander like a restless sea-bird among the hollows of the sand-dunes. For men of these my times there does exist a language of things — a voiceless tongue, sensitive to the most subtle distinctions, exquisite beyond the scope of words. Between the world and us there goes on a mutual testing which evolves skeletons of explanations, only to see the problems transmuted into the rungs of a ladder which stretches far into the blind mists of infinite time and space.

And this irregular shore, whereon the seaweed becomes tangled with the delicate beach flowers, has the task of writing in the sands its own history for all men to read. And what is that story if not that of the planet and of myself — expressions of planetary life rooted in forms of universal existence that have been a part of life, or that restlessly are waiting in reserve to become so? Everything is interconnected and interdependent. What a task it is to know ourselves! No link in the chain can be snapped. No matter which way we turn, we can see but the flowing stream of events. 'Beginning' and 'ending' become meaningless words, for the series of phenomena can never be interrupted, regardless of conditions.

Meanwhile the earth fascinates us with its pageant, tempestuous or serene, now in the heat of the dazzling sun, now under the mysterious scintillation of the luminous night. We behold the oceans, quiescent or raging; we see the wrath or the no less dreadful silence of the earth's subterranean fires; or, again, a world of flower-decked hills, of harvest, of spring. We rejoice in the deep forests, in the waters of the earth, which in the majestic sweep of rivers, in the brooks that babble happily along their banks, remain forever mysterious. We are awed by the mass of the snow-capped mountains — ancient convulsions petrified. Such is the earth, with its unloosing of universal life that brings

us the full gamut of living things from the flower to the bird, from the lichen to the elephant. Is it reasonable to expect that in the general orgy of power our quivering young world should lack only the too often cruel pity of its God?

If, instead of having dropped from the empyrean on some day when it was raining living creatures, I issued from the earth as a passing incident in the eternal chain of phenomena, I can at least question the various aspects of my planet and at the risk of colliding in the dark with the walls of the unknown investigate link by link whatever is comprehensible in the world and in myself.

If this be so, these high sand-dunes that the wind scatters or heaps up, this monstrous mass of salty sea alternately singing and roaring, now tossed by tempest, now cowed by the sky into the precarious peace of a fury sullenly repressed; this bottomless abyss that conceals the thrills of life with which proud earth loves to bedeck itself; finally, this vault, immeasurably distant, now dazzling and now veiled, wherein dead or flaming worlds unendingly pursue one another — all must be parts of that elemental chain from which my whole story depends. There is something of me in the star that I shall never behold; there is something of that star in the profoundest part of me. All the incidents of the passing hour take shape only to disappear as soon as they have appeared. They are like the tragic blinking of lighthouses which at night suddenly dazzles me, and as suddenly leaves me blind in a darker night. Perplexed by a contemplation of ourselves too often sterile, we cannot detach our sensation from a universal order in which things separate themselves only to reunite in eternally new beginnings. Repose? Change: everything except inertia.

Because the 'sacred' books of infant man told us so we have believed ourselves the pivot of the world. That error has been expelled from our intellect, but will it ever be driven from the *chiaroscuro* of our inherited emotions? However, the time has come when we can gather together enough observed facts to begin to understand something of

ourselves, in terms of a preliminary appraisal. Is such an attempt foolish or wise? My painful hesitation would in days gone by have been a portent of happy or baleful augury. What is there, then, in life beyond trying? Lies not our choice between fits of impotent anger and the stout enterprise of steadfast wills? Life is at best a chance to dare.

DISTINGUISHING AND INTERPRETING WHAT IS

In the confusion of universal activity — an activity which blinds before it enlightens us — the first impulsive effort of our understanding leads us astray into a thicket of illusions. If we are to distinguish little by little what seems to be from what is, we must submit the errors of our improvised explanations to the tests of verified observation.

Even then the task will not be done, for that conflict of the elements, the first terrifying vision of which has remained inscribed upon the very heart of our theogonies, strikes us a blinding blow. It is from that shock that we derive our first sense of an ineffable poem, the burden of which is that our destiny should be to assimilate ourselves to it and to develop it, if we are to attain ideal life.

That poem is a thunderous symphony of ourselves and of the elements to which we are indissolubly bound — a symphony that brings us complete emotional perception of life and of the sovereign charm of beauty, to which even the animals are not insensible,[1] but which needs the sounding board which we ourselves supply to attain the ephemeral splendor of its perfection. But fully developed man is needed to produce that effect. Without man the beauty of the flower, except for a futile radiance of supreme and voluptuous charm amid the indifference of things, would be only one among many other examples of exhausted subjectivity. Whether or not the eye of a bird at the sight of food or of its mate perceives or reveals joy, it is in man alone that the supreme sensation of beauty can be completely realized — a realization effected by a superior sensitiveness which is the crowning harmony of the universal

[1] Darwin.

world. To man is accorded the highest, noblest harmony possible between living creatures and the Cosmos, even though he often prove himself unworthy of such a favor of fate.

Since there are in the universe active and everchanging things which can attain complete harmony only through us, it is our duty to extract that treasure, to store it, to manage it, to increase it, to develop it, as our personal capacity may permit, in order that in the brief flash of our existence our own effort may keep step with the swiftest tempo of the progress of the world. Are not even our dreams — whether they result from feebleness or from an exaltation of energy — efforts to broaden and raise ourselves?

Each moment of our lives is consecrated to this indescribable festival. Low or loud, the calls of the exterior world invite us urgently to get the best out of life by developing the sensations with which the most fleeting glimpse of man and of his universe assails us. Christians would inspire in us, wanderers from the right path, a contempt for the earth. Let us rather cherish it with respect, filial love, pious veneration. Above all, let us begin by trying to comprehend it, since to do so we need only the ability to question.

Plains, valleys, mountains — the earth rejoices in the infinite record of light slowly overspreading the rude screen of its rocks, or the vivid show of its flaming vegetation. Our trembling planet, with entrails of fire beneath its flowers, swept by its sun in the desperate current of an indescribable epic, with its sea heaving under the solar fires, or bursting forth in fathomless furies — what do these contrasts mean? Do they seek our brutal initiation into the swing of the energies of which we are the plaything, or are they our ecstasies before the awful spectacle, once cause of horror, now source of the deepest wonder?

Ecstasy is good, but it is not enough. To appreciate to the full the flavor of the world and likewise to realize the futility of our complaints and the glory of our joys, we must try to *know* the world and to welcome the creative

elements of life even though they be perpetually interlocked with destructive factors.

Such as they are, the activities of human life are the masterpieces of all things visible to us, opening as they do, according to a famous saying, an equal opportunity for enthusiasm both to him who would exalt and to him who would abase them. Soon, also, comprehensive generalization will seek lofty ideals and dreaming will still be a way of understanding, provided we do not cripple our daring with a too dangerous contempt for actual relations. Finally, who shall say whether the superb flaming up of unconquerable heroism that through the sacrifice of the human creature to an ideal of beauty braves for an hour the infinity of time and space may not be substituted for the dreary reward of the Buddhist Nirvana?

Thus haunted by imperious questions and uncertain answers, I sometimes seek solace from the silent enchantments of the great forest of live oaks that the jealous ocean has guarded from the intrusive public. In the soft, sparkling light a fine, bright rain of sunbeams sifts through the little shriveled leaves and caresses the ghostly trunks that stretch out knotty arms — arms now tossing in revolt, now resting in ingenuous grace. The woods are suffused with the charm of early morn filtering into the clearings, while gleams of every tint of white on the distant crests of the waves, wherever the sun breaks through the clouds, form the background of the wild, rugged vista. Shadowy trails wander away under the ferns and impart a new life to the tawny tapestry of the pines with their trunks of violet, scale-like bark. Here a world, complete in itself, without gesture and without voice, awaits the human drama. What better setting could the fancy of a dreamer ask?

For the scene bespeaks dramatic action through the suggestive power of the setting. Look at that opening where two paths cross. Queen Mab has just gone by, followed by Titania the Divine fascinated by Bottom's donkey ears. It must have been at that bend that Benvolio, dagger in hand, rushed upon the indecorous person who almost awak-

ened Montagu's dog with a Capulet sneeze. At the bottom of yonder sandy pit Hamlet found himself face to face with the skull of Yorick, whom he had so greatly loved. Behind those rocks are Caliban and Sycorax. And those are the selfsame branches that Malcolm's soldiers are about to pluck for the miraculous march of Birnam Wood to Dunsinane, wherein the witches, crying their incantations, foresaw the certain sign of the end of Macbeth.

Dreams! Dreams! Solitude is haunted with dreams that, because of their deep significance, become embodied in lives sprung from our own and in which we see something of ourselves reflected in the fictions which pass before our eyes. Can it be, then, that there is nothing beyond the hallucinations which our emotions evoke? Shakespeare's fancy took a far flight; but if we must go a-riding on our dreams — what are dreams drawn from the finest legends of agitated lives, not unlike the myths of the gods, in comparison with the profound drama of the forest and of its denizens, bound up as it is with those activities of the universe which tend to perfect the human race?

Compare with the happy flow of this apparent peace the cruel undercurrent of the turmoil of hostile existences in which creatures of every degree of complexity have the primal function of destroying one another in order to live. From the humblest lichen to the ruminant and the savage carnivore, all rush into the implacable combat that death alone can end. 'The law of the jungle' ordains a despotic 'justice' in the universal carnage. Everywhere in the immensity of space and time miseries result from sensuality mingled with murder, the real sufferings of which are quickened by imaginary torments. Everywhere there are sensibilities the existence of which is proved by the torture of puerile nightmares, by the acuteness of our consciousness of joy and misery which the mere anticipation of sleep is enough to disconcert. What degree of ignorance do we need to make us infatuated with ourselves? And what degree of understanding do we need to explain ourselves at least partially? Does it not prove that the laws which govern

man harmonize with those of the world, since we are always brought back to the permanence of their interrelations?

We cannot avoid appreciating to the full the difficulty of the problem when the investigations of biology show us that all those organisms that oppose and kill one another in order to live descend from the same stock. Cain is a glaring example. From the protozoan to the highest form of humanity, at every stage of an indefinite ascent, we inevitably find in an unbroken thread of interdependence the common traits of common organic activities. Thus, after mythical explanations have failed, scientific research will show us man in the guise, no longer of a defective demigod, but in that of a progressive representation of the evolution of life moving toward the unknown destination which we vainly try to anticipate in our dreams.

Thus, the thousand-year-old forest whose age is testified to by its giant limbs, after serving as the stage for the characters of the Shakespearean tales, to-day, because of the progress of knowledge, presents the equally absorbing but different drama of what actually is. This is what comforts the thinking man, working as best he can amid the turmoil of his hopes and of his disappointments.

For many, alas! the end comes prematurely; theirs have been inchoate lives following the will-o'-the-wisp of appearances, of figments feebly usurping the functions of realities. In time comes the catastrophe — the climax of a play empty of substance; a noise of words, devoid of human significance, blowing down the wind. Can it be called living merely to pass by with unopened eyes? How can man hope to see the light if he centers his attention on the smoke that rises from the torch? In sharp contrast with such weakness, compare the irresistible strength of the man conscious of evolution, who, having dared to live according to his lights, sees in the episode of dissolution only the end of an opportunity to toil.

What could primitive man have discovered about himself or about the world in that first shudder of conscious-

ness which tore away the curtain of obscure sensation, and which gave knowledge its first start, even though in a wrong direction? Our brother animals, sacred legends to the contrary, claim the credit of starting that organic drama, even though they failed to carry the enterprise through to the end. The animals, who appeared upon the scene long before us, were, so to speak, the first products of its influence to render unto the sun the things that were his within the limits of their powers.

Ours at least the right to dream while knowledge lags. The earliest poems and the books called sacred are filled with miracles, and have a way of dividing the drama of man from the drama of the world into theatrical contrasts — a course, as subsequent events indicated, perfectly suited to baffle their early efforts at assimilation. First came the inevitable mistake of subdividing the Infinite into 'beginnings' and 'ends,' words that correspond to no phenomenal realities, since they denote nothing beyond misunderstood sensations. India, which by its Wheel of Things, symbolized the universe as made up of an unending circle of linked phenomena, was not deceived. And we in turn shall admire 'the nature of things' no less when we begin to recognize it as it actually exists. When that time comes, instead of floundering about in a general misconception of the world and especially of ourselves as protagonists, we may attain a rational self-satisfaction.

In terms of imagination we see everything as a theatrical climax. As a matter of fact, we can grasp nothing except transitional and subjective stages in the perpetual motion. The latest views on the constitution of the atomic world, together with our present orientation toward the fundamental unity of the formula, matter-energy, may foreshadow new fields of generalization. But, however far those generalizations may be pushed, we shall find ourselves no nearer the ultimate, since everything resolves itself into infinite series of linked phenomena.

Still too undisciplined to accept scientific knowledge, the average educated man remains mentally attached to the

inherited notion of a cosmic drama which with childish egotism he claims is built around him. A little modesty would not be amiss. We cannot grasp phenomena except in the places in the coördinate whole to which their development assigns them. But is it not marvelous to be able to deduce from them the sense of actuality? And since that is not within the reach of every one, all the more imperative becomes the duty to persevere.

That sensation is the principal characteristic of animal life, and that a nascent intellectual life is constantly emerging therefrom through the association of mental pictures of developing individuals, is something which is becoming increasingly hard to deny. Imagination has worn itself out trying to turn the beast into a machine in an effort to approximate man to his divinity — thus leaving between him and the animal kingdom the impassable abyss into which Descartes slipped.

We have seen fit arbitrarily to term instincts all the mental phenomena of the whole animal kingdom — except those of man. Man we have metaphysically supplied with an immortal — that is, a semi-divine — soul, permanently related in its vital activities to its Creator. Thus the beast of more or less developed understanding is absurdly classified as a mere living mechanism exhibiting only mechanical activity, whereas man, the chosen creature of his God, who grants him the contradictory favor of beginning but of never ending, finds himself promoted to the distinguished rank of a demigod fallen on evil days. Such are the lessons which almost universally we continue to teach to our children in order to heap social opprobrium upon the man who does not at least feign to accept these doctrines.

Darwin brought a terrible catapult to bear against the whole structure of fallacies of which, with the calm audacity of a fearless conscience, Lamarck, first in the field, had undermined the supports. Although we are still awaiting a sound comparative psychology in which sensation and ideation are assigned their proper places in the ascending scale of developing life, the bastion of Biblical dogma has

already been so triumphantly carried that its defenders have no place of refuge except in vestry rooms. Too many facts have been established and placed beyond the reach of attack longer to forbid this discussion — as the Church, to the contrary notwithstanding, persists in maintaining.

If the world, without beginning or end, continues momentarily 'to be created'; if modern man is the result of a long evolutionary filiation of ascending life; if our cerebration, like every other function of the animal organism, is threaded on an indeterminate coördination of phenomena, how can we avoid the necessity of following step by step its course through the whole animal scale, in order to mark the seriation of organic activities, until we attain a scientific view of the mental organism and of how it functions?

THE EGO

After having maintained that the universe contains the Ego, and that the Ego cannot be isolated from it, it may be surprising that I should begin the study of the Cosmos with an attempt to determine the nature of the Ego. And indeed, if it be admitted that the Ego emanates from the Cosmos, and that it cannot be explained independently of the cosmic series to which it is irrevocably bound, it is nevertheless in the organism of the Ego — a part of the universe in which the universe is reflected — that I propose to gather the illustrative material on which I base my interpretation of actuality. It is advisable, therefore, that I begin by inspecting my perceptive apparatus, the duty of which is to record the raw material of knowledge. After which I will set down the sequence of impressions, subjecting the interpretation of them to the acid test of previously proved facts. This may easily prove a method which, at the risk of digressing, will often tempt me to anticipate my subject. I can hardly do otherwise since there is neither beginning nor end in the universe and since the subjective origin of knowledge requires, at least as a base, the noting of some first starting-point of experience. In spite of the subjective isolation created by the individuation of the Ego, it is necessarily

the universe that is asking questions of itself through the complex of my personality. The humanly dramatic quality of its successive responses affects it through the reaction of my own activity on the various elements of the universal synthesis.

Metaphysicians ask of the Ego the secret of the universe; I shall not. On the contrary, I propose to seek in the Cosmos the secret of my individuality. That accomplished, all I shall have to do in order to follow the course of the cosmic series is to connect the phenomenon of individuation with the evolutionary activities causing it. The decks will be cleared. I must take that starting-point or none, since my sense of my own permanence is illusory, and I am dealing with the Infinite. Such being the case, let us investigate this mysterious cosmic Ego which is not afraid to face the Cosmos from which it emanates.

Will the Ego, which our efforts toward organic self-preservation prove to have existed in us from the beginning, manifest itself in some uniform way — in the plant, in the molecule, in the original cell, in the plasma, in the solid or liquid crystal, in the colloid itself? The strict sequence of phenomena through the organic development of our synergies requires that it should so manifest itself up to the point where an individual personality is created.

This intangible, dominating Ego seems to me permanent although it is unceasingly evaporating through all the pores of an ever-changing organism. Why, then, should it claim superiority over the elements which unquestionably control it? How does this individual yet gregarious Ego, with its social organizations which range from the savage tribe to the ideal of patriotism — mother of heroism and of suffering — live up to the hard-won 'truths' and the grandiloquent maxims which it so proudly boasts? Should we not, before seeking that Ego, go back to the primal sources from which the individual is sprung — that is, to the phenomenon of *individuation*?

The constitution, increase, and evolution of an individuality in the cosmic activities either of the animate or of the

so-called inanimate world [1] seem to belong to those rhythmic oscillatory movements that physico-chemically are summed up in universal alternations of concentration and dissociation. Newton was unable to carry his analysis farther, and I suggest that we shall do well to remain in his company. We might perhaps go so far as to say, however, that individuation is one of those developments of automatic tropism at which our scientific researches [2] into the activities of the world to-day come to a standstill. There is nothing incompatible in the two statements.

In the wide field separating star from atom we can grasp nothing except the effects of differentiated attractions. Nebulæ, comets, stars, suns, milky ways, planets, and satellites concentrate and dissociate themselves in the most manifest of individuations. So with the atom, with its nucleus of positive electricity, with its electrons, ions, etc., of negative electricity cast into molecular alignments (Brownian movements) that are productive of new individualities, half-cells, flocculations, etc. The world is the universal meeting-place of all kinds of combinations of individuals connected in systematized synergies, whereas all that metaphysics can do is to juxtapose them artificially without positively determining their relations.

That the life of organs changes the status and aspects of complexes in process of individuation can astonish no one. It takes a long time for mineral evolution, but a far briefer one in the case of organic activities, whose very complexity exposes their lives to many accidents. For that reason there exists a progressive intensification of individuality throughout the living series until it reaches its acme in human personality,[3] which the descriptive function of articulate language aided by realized abstraction (of which Locke tells us) tends more and more to distinguish from its environment until it becomes a metaphysically isolated being.

[1] Happily defined by Diderot: 'a general conspiracy of motion.'

[2] See the chapter: 'Evolution, Tropisms, Rhythms.'

[3] The word 'individuality' is a mere negation. The word 'personality' affirms a unified dynamism.

As schoolboys know, the elementary properties of life — nutrition, assimilation, perceptivity, motility, and reproduction — manifest themselves successively in the consensus of organic activities, the actions and reactions of which are united in the functions of the 'complex.' In the amœba and in the infusorian, owing to the nutritional needs of their anatomical elements, there appears the beginning of the specialized or more or less conscious sensibility of an Ego, for in these creatures the necessity of *choosing* food provokes an incipient reactivity which later developes into will. Thus the general characters of the hereditarily transmitted individuality will be determined and developed together with the elements acquired through general evolution, which are fixed by heredity.

In the established course of universal law there comes for each of us a time in the process of evolution when our relative personalities are brought face to face with cosmic infinity. Metaphysics tries to escape the difficulty by verbal ingenuities. It has endowed infinity with an essence (which is the 'Divinity') and the human Ego with a soul (an entity of inferior rank in the hierarchy) to make sure that quarrels over supereminence may prosaically result in the victory of the stronger. Thus the universe endowed with personality and the Egos without number are justified one to the other to the satisfaction of a verbalism immune from scientific tests.

Just what the essences, the entities and the supereminences may be, no one can tell, for the words acquire a meaning only when and if all experimental investigation is abolished. The hasty self-conceit of error does not like to have its credentials examined. Meanwhile, slow and painful knowledge acquired through observation makes its obscure way through the morasses of misconception, among which, much to the discomfiture of magic-mongers, it establishes little islands of fact — firm ground where space and time are operative. Among the most appalling breaks in continuity into which our observations seem to sink there is no more besetting problem than that prodigy which we

shall hereafter term the 'phenomenon of personality.' It is a problem that of course does not at all embarrass the band of prophets. They are quite satisfied to explain the world as the product of an inexplicable ruling Personality which also gives birth to other inferior personalities, without which it could have no excuse for existing. By the very simple expedient of suppressing debate by violence the very negation of explanation was held to be explanatory through ages of retarded mental evolution.

The principal part of what has been written on human personality from the remotest antiquity down to our own day consists of metaphysical tautologies, permanently embodied in the symbols of realized abstraction. What could one expect if not a more widespread misconception of facts? The boldest could only restate the formulæ of insoluble problems, whereas it would have been quite sufficient to accept the phenomenon as it presented itself in the long series of beings to have seen at a glance suggested lines of thought rich in possibilities.

The phenomenon of the make-up of an Ego naturally offers the widest scope to those phantasmagorical mental gymnastics into which the supercilious inadequacy of metaphysicians plunges. The error of assuming that words and things are identical because of the magic of realized abstraction [1] — one of the very earliest mistakes of reasoning — has been responsible for many strange wanderings through the quagmires of logically correlated misconception.

However, no misconception can indefinitely resist the test of time, and we have arrived at a period in which the achievements of constructive science must outweigh the dreams of clouded imaginations. How the phenomenon of personality of which our lives are the proof could originate in the impersonal universe was quite beyond the understanding of our remote ancestors, whereas it seemed to them quite simple to impute to a universal cosmic personality — that is, to a being without the limitations that make personality — the procreation of earthly individuals in

[1] See chapter on 'Men and Gods.'

imaginary cosmogonies. However, we cannot escape forever the acid tests of proved facts. Why are we so prone to explain a thing before we have examined it?

In the organic and even in the inorganic world (which we call structureless, but which, nevertheless, is very much a matter of structure) we have seen the phenomenon of individuation confer on elementary groups a particular character of relative independence in relation to elementary groups in order to set up a transient dynamic unity. From it are derived the innumerable individualities of the fauna and of the flora which spring from the cellular plasma, and which in the inorganic series are represented by mother-liquor and crystals, which are all various forms of colloids. The untrained generalizers of the first ages, hypnotized by that spectacle, reached the point of personifying and delimiting the Cosmos itself — that is, Infinity — which precisely because it lacks limits is incapable of actual individuation.

Thus put into its right place, the phenomenon of organic individuation gradually grows more definite as it rises in the animal scale; it progressively achieves sensibility, consciousness, mental power, and volition, until it attains to the personal activity of thinking man. We can define the Cosmos as a universal interdependence from which nothing can escape. Apparent independence carried to the point of feeling one's self a 'free will,' resulting from one's unconsciousness of controlling organic forces — such is the man in whom personality is evolving. Between those two limits our organic activities oscillate according to the law which decrees that the stronger impulse shall constitute our will. In the sum of human determinism the forms of individuation take shape through the intervention of sensibility, which characterizes the activities of personality while it develops them. It is in fact the speaking-trumpet of a synthesis of energies, generating a transient unity of direction.

Thus a dynamically unified personality, more or less exactly determined, is the coherent state of a dynamically unified organic complex of a unitary dynamism, itself re-

sulting from an evolution of anterior coherences, proved by the embryonic evolution representative of them. The same laws that group the individual atoms in individualized molecules, with all the resulting complexes affecting each and every activity (mechanics, physics, chemistry, biology), alternately disperse and gather all forms of energy. Individuation simply represents one of the innumerable degrees of the universal dynamism.

When Jean Perrin tells us that the number of molecules contained in a gram-molecule of any substance runs into twenty-four figures, and when we adjust that idea to the kinetic theory of humanity, we reach a condition almost beyond our grasp. The discontinuity of the three states of matter, solid, liquid, and gaseous, is secondary; it is a mere question of the relations that speed, mass, and temperature bear to one another in the unbroken chain of phenomena, no one of which can under any circumstances be detached from the whole.

If we seek out what preceded the phenomenon manifested through the appearance of the organic cell and of its plasma, we are not much surprised that Lehmann should get peculiar crystalline formations, which he terms 'semi-fluid crystals' and even 'liquid crystals,' and which act like crystals on polarized light. Even the semi-fluid crystals show traces of polyhedral limitation, for they display planes and angles rounded by surface tension as well as certain other configurations 'that tend to take a regularly spherical form.' The transition from the crystal to the cell thus appears to be singularly facilitated. 'What is our understanding of matter?' asks de Launay in his 'Histoire de la Terre.' Equilibriums of physical force. Whenever possible these equilibriums assume the crystalline form — which is the concrete expression of them and of their synthesis — and, furthermore, they assume the most perfect of all crystalline forms, the centered or cubic. Of their own accord the asymmetrical molecules heap themselves up and group themselves in piles that have a cubic symmetry. Thus the internal forces balance the external forces, since, to use a simile

already borrowed from the organic world, they can so best resist destruction. That is why, like living beings, crystals left in the mother-liquor are nourished, replace the parts taken from them, and heal their wounds.[1] And de Launay goes even farther: 'The general trend of organic evolution results from the growing tendency of organized beings to become independent of their environment, and to become specialized.'

Just as the transition from the solid to the liquid and from the liquid to the gaseous state glaringly exposes the inadequacy of our old classifications of the apparent facts, so the transition from the so-called inorganic state (crystal and solution) to the organic state (cell and plasma), particularly distinguished by osmosis through the cellular wall, tallies so remarkably well that our old, wholly subjective distinction between the organic and the inorganic is badly shaken.[2]

Consider the experiment of Jaques Loeb, who by bringing a foreign substance into contact with the egg of the sea-urchin chemically produced an artificial fertilization followed by an incipient fœtal growth (parthenogenesis). Must we not admit that the inorganic and the organic manifestly become identical? [3]

From its first motions the newborn creature of whatever species becomes conscious of itself through the sensations that reach it from outside itself, whether they are isolated or are more or less confusedly grouped in the sum of environing reactions. Owing to the organic unity of the sensitive plate, the consciousness of a ruling dynamism emerges from all those reciprocal contacts between the individual and his surroundings, and consequently every one

[1] There is little difference between generation and regeneration. Every one knows that the arm of the aquatic salamander if amputated grows again. If you cut an earthworm in two, the head grows a tail and the tail grows a head.

[2] The cell filters the environing elements, which under the action of the solar rays provide chemical compounds suitable for organic use.

[3] The development of the fœtus cannot go very far, since it does not enjoy the chemical and biological conditions necessary to its growth.

comes progressively to recognize and define his Ego, his personality, in synergies of sensational states prolonged by what Loeb calls 'associative memory.' How can any one deny this unitary consensus, so obvious in all forms of animal life? In the whole animal kingdom from the amœba up can we discover anything but transmitted motions indissolubly interconnected?

The protozoan's sensitive reactions do not greatly differ from those of the vegetable, as, for example, in the choice of food. Does not the potato, germinating in a dark cellar, sprout toward the light? There would, then, appear to be an individuation of the plant — an animal, a vegetable, and (when crystallized) even a mineral Ego, identical in origin and in kind with the human Ego, and more or less perfected according to its rank in the hierarchy of development. Does not the humblest flower afford better proof of the existence of a more sharply defined evolution of personal sensibility than the ordinary mimetic manifestations in which so many persons try to find a pithecoid 'personality?' The feeble individuality of weak men conceals itself in imitative practices — a simple and easy expedient which produces an appearance of individual character.

Again, we feel no hesitation in giving to animals that live with us intimately personal names, and they, on their part, are sufficiently in sympathy with us to answer to those names when called. Do not animals of all categories constantly manifest the sentiment of the personal Ego by acts of self-preservation and of foresight, which, as in us, are predominant instincts? If animals are neither mere machines nor incidents in the march of evolution toward humanity, will some one kindly tell me how to account for their activities? For of one thing we may be certain: never shall we reach an understanding of actual phenomena by a general negation. Yours to choose between the theory of evolution and miracles. Make your choice now or later, for the dilemma will not change.

Furthermore, can we fail to recognize between us and the domestic animals of whom we have made real friends some

bond of nature?[1] If you eliminate organic similarities, you are forced to the conclusion that the dog that rushes to the defense of its master is acting in a wholly inexplicable manner. Who ever saw a dog moved by the felling of a tree or the splitting of a stone? And, again, can you account for the mystery of why man's 'soul,' halfway to divinity, should show itself so often meanly selfish, while the brute beast conspicuously manifests self-devotion, altruism, which are masterpieces of the human morality 'divinely' affirmed by the Cross of Calvary? The fact is that observation discloses an inevitable series of phenomena in which general activities, taking form in organic differentiations, ultimately lead to individuation. Between the algæ and the most cultivated man there are relations, and those relations are arranged in the scale of existence exactly in the progressively graduated steps of a continuous ascent that guides us through all the transitional intermediate forms, first to the uncertain gropings and then to the complete emergence of personality.

To be aware of one's existence and to understand one's self are two quite different operations. But when we try to understand the universe by analyzing an Ego in which will and thought (apparently irreducible) are present, what can we do except shift that will and thought to the universe, so that we may explain phenomena by means of a Supreme Will and a Supreme Thought — termed divine — which are merely human will and thought glorified? And as soon as we come to realized abstraction (the effects of which we shall soon see), we shall have on our hands a crop of infinitely variegated gods, ensconced in mythical achievements from which it will be next to impossible to oust them.

However, the battering of scientific observation is now wearing down the barriers that our earliest misconceptions so easily raised between our first subjective vision and our later acquisitions of facts. Before we could observe, we could but seize upon those verbal solutions which will probably hold a place in the history of the human mind but

[1] Does not domestication itself imply some organic likeness?

which hereafter will be objectively unimportant. *Vital principle, spirit, soul* — of what use can these mere words be, the vogue of which was, and still remains, so great in spite of the fact that no one has ever been able to tell what they are, since they cannot be correlated with our verified experience.

By methods which no one takes the trouble to describe accurately, many persons seek to superimpose upon our organic Ego, the inherent activities of which are incontestable, the metaphysical Ego which was once regarded as the unique spring of human action but which is now reduced to becoming part and parcel of the physiological conditions of the hereditary Ego. The soul was invented in order to explain the body — but lo and behold, the body explains itself through the play of its phenomena; whereas to this day no one has been able to enlighten us on the relations between the soul and the body that it is supposed to actuate. Who can explain the heredity of souls, or, further, how poison can act on the soul through the body. What we are being asked to do — and by its very terms the proposition is self-contradictory — is to create an Ego by grafting the *material* upon the *immaterial*.[1]

The soul will have had its day — a day without a morrow — in the various philosophies that we have constructed of nothing except words. As soon as we began the study of thinking man through observing the living man and his antecedents, the existence of the scholastic entity came to an end.[2] Thinking life will manifest itself in the evolution that experience of the world in which we have sprung up assigns to it. The fact is that the Ego is a complex, an interlinking

[1] Saint Anselm, who probably realized the difficulty of any other procedure, asked God to let him live that he might solve the question of the origin of the soul — 'especially,' he added, 'as I do not know whether, if I died, any one else would be able to solve it.'

[2] Even recently the 'philosopher,' so-called, who wished to discover his Ego shut his windows and put his hands over his eyes, so that he might the better give himself to an inner observation of the soul he sought to find. To-day we know that no aspect of man can appear except in the light of his relations with the universe. The first requisite is to have the too uncommon courage to open the windows and to look.

of momentary organic relations, and because we are unconscious of the activities of our subliminal life we are left with the sensation of a unifying consensus.

We were taught at school far too carefully to forget what metaphysics has made of the organic consensus that determines the dynamics of personality. The *Ego* is the entity *Soul*. What is the soul? It is anything you please; but in any case it cannot be defined except as a word put forward to explain by intuitive authority the phenomenon before observation has analyzed it. We must ask no more about it, and above all we must not take it into our heads to seek in sensation the origin of knowledge; that is to say, we must not look for the manifestation of sensibility in the sensible organ. Having based the ruling element of the individual on a word that lacks objective foundation, the metaphysicians had nothing more to do but to connect the functioning of the immaterial soul with the material organs. Under that general heading they talk of everything except the connecting link — which is impossible to find.

The unrivaled store of verbiage corresponding to no observed facts that has accumulated in the literature of the Ego passes all imagination. Libraries bury the books under a venerable dust — significant sign of the progress of human understanding. All that mass of writing results from a disjointed state of general culture which divorces the two kinds of mental development (speaking and thinking), the competing solicitations of which merely increase the confusion of the misguided. A whole world of publicists obstinately cultivates the art of writing, while relegating to second place any positive acquisition of ideas. We have writers, and we have men of science. They are too often separated by a water-tight partition [1] that isolates them to such an extent that some persons have recommended to us on identical grounds the simultaneous wor-

[1] The day when the academic distinction between literature and science disappears will mark a great step forward. When shall we come to comprehend that in order to talk of man and the world it is necessary to study them?

ship of the altar and of the laboratory, though they do not tell us how, in view of the dissensions typified by the martyr's stake, the two can be reconciled.

At this point I should perhaps do well to call the reader's attention to the first result of a transposition of elementary phenomena. He will then find it easier to grasp why the Ego, artificially separated from the organism that produces it, will not willingly consent to see itself reduced from its 'splendid isolation' to the humble rank of an ordinary ephemeral phenomenon. Emancipated from organic phenomena, it would like to remain in this magnificent isolation. And since it could do so only on the hypothesis that it had attained freedom from objective reality, there promptly resulted the exaltation of an intangible Ego, wandering along the paths of eternity. With one superhuman leap it made itself sublime, and the metaphors gathered in crowds to acclaim its supernatural preëminence. It was a *spark*, a *flame*, a *breath*, an *emanation* of the 'Universal Being' — anything you wish, provided it was spared the humiliation of having any relation to actual facts.[1]

That linked reactions of sensibility, consciousness, and personality always continue to shift and change along with the organisms that produce them is the evolutionary law in obedience to which each link is switched this way or that, according to the potential of its antecedent activities. We have only to open our eyes to see that personalities evolve. Consider yourself, O metaphysician; think of all the things you have been at different ages, of what you have been in your successive sentiments, in your thoughts, in the hereditary states of your consciousness that in you so often pull in opposite ways or even nullify one another in spite of the 'immutable' semi-divinity of your Ego. How, then, can you introduce that 'heredity' from whose dominance you can-

[1] Common people, who too often are metaphysical without knowing it, like to use this curious formula to explain an irresistible impulse: 'It was stronger than I.' It is as if they had the vague consciousness of something higher than their metaphysical Ego, of an organic consensus, the superior energy of which determines the issue.

not escape into the incorruptible essence of an immaterial entity? Is there, then, a bond of generation between entity and entity similar to that between body and body? If that were so, the entity would be nothing more than a common phenomenon in the world of fact — a dreadful thought!

With the exception of the hypothesis of divinity, there is no question on which men have more generally talked nonsense than on the question of the nature and conditions of human personality. When we go in quest of Abstract Being, Τὸ ὄν, what a task it is to connect it with the organic individual! A remarkable thing about metaphysics is its ability at all times to adapt the transcendence of things to its fancy, unhampered by facts. The great fault of the Ego is that it exists objectively — which is always a stumbling-block to those who would like to see it dissolved into the vapors of quintessential quintessences.

Apparently, a man who wished to know something of the Ego, its nature, its relationships, etc., would be singularly foolish, should he take it into his head to submit the organic individual to observation. But the task of evoking Being-in-Itself, which no one has ever met with, and of which no one can say anything except that it is outside every concept of fact, is too tempting, since it requires only a verbal image, of which sound is the only substance.

Fénelon, who so liked to insinuate, in an excess of candor put the mysterious genesis of such verbal sonorities into a formula that holds a middle course between soul and fact: 'O God, Thou canst say: "I am he who is. I am not that which is. I am almost that which is not."' Well, there stands the Ego of the metaphysician. It is neither that which is, nor wholly that which is not. We are, it seems, fragments of a degraded divinity. What a foundation on which to erect our genealogy! That is the clearest thing in ontology, which calls itself the daughter of inward observation because its interpretive formulæ need a trace of substance — to distort them! Some fools waste their time in trying to bring about a self-contradictory reconciliation between the rudimentary metaphysics of primitive miscon-

ceptions and the experimental method, as Descartes conceived it, and have naturally been unsuccessful. An example of the yawning abyss between chatter and carefully controlled observation!

Nevertheless, we must make up our minds to face the problem of personality[1] as it exists throughout the whole scale of existence. To assign to the individual a place in the scale of his fellow-beings according to the differences or the analogies between his and their organic characteristics, is the only scientific solution of a scientific problem. There is never anything in an entity except that which we ourselves have put into it, and yet we seek for what was there originally. Let us not be astonished that the finest minds have failed utterly in trying to use such a very parody of method.

The recognition of a common thread connecting all things, according to the law of successive stages of evolution has made the problem so clear that metaphysics becomes perplexed and no longer knows where in the torrents of vital forces to find the 'fixed' position of its Ego. There, as everywhere else, the phenomena of individuality — that is, an organic 'complex' of synergies — evidence nothing but a series of shifting states which nothing can stop and which bursts the rigid mould of the phraseology which we have regarded as expressing the facts.

The phenomenon of life, in which man is included with every other living thing, demonstrates every stage of an evolution of which primitive man with his savage Ego, and the modern man with his civilized Ego, are successive, and unquestionably connected, manifestations. We can note in the same individual, whether it belongs to the simplest or to the most highly complex organisms, the innumerable successive Egos, more or less conscious and more or less evolved and all marked by a need of self-preservation, growth, and continuity. The life story of each one of us

[1] The idea of a *mask*, implied in the word *persona*, perhaps shows that, prompted by instinct, language was not deceived about the nature of the Ego as an *image* of personality.

thus presents in the same individual a wide assortment of differentiated or even contradictory Egos within the limits of their determining forces, whether hereditary or acquired in obedience to the law of evolution. All that is needed now is to try to reconcile unceasing mutation with unceasing immutability.

Primitive men must have noticed flaming stars in the sky, and on the earth, seas, valleys, mountains, animals, and men who knew not which way to turn. But only much later, and then without being over particular about the quality of their classifications, did they conceive the idea that these things were actually coördinated, nor did they strive for any objective comprehension of them. Woefully hampered by ancestral metaphysics, which persists in wishing to find in man the secret of the Milky Way, their descendants racked their brains to ask direct questions of the universe. Nothing could have been more natural from the ancestral point of view, which, *a priori*, was that of a world made expressly for the human race. If it be true that the stars are arranged to suit the ends of man, it might perhaps be well to know at least in part something of the bond between them and us. No one has yet dared try. On the other hand, successive, carefully tested experiment has begun to make clear the stages of a coördinate evolution from nebulæ to suns, from suns to planets, from planets to all life, including thinking man. In respect to the miracle of that Ego in which all the activities of the universe should be found centralized, all that the metaphysicians can do is to base the mystery of it on the greater mystery of an entity, a soul, a breath, a flame, a no-one-knows-what, the elements of which must be regarded through smoked glasses. All the metaphysical solutions are *petitiones principi*, that is, they are words that answer a question with the question itself.

Look as you will, where will you find the soul?[1] Mean-

[1] The greatest absurdity is that the body had to be brought back to life in order to chastise the soul, responsible indeed, but protected from punishment by reason of its immateriality.

while, all the organic egotisms of all the individuations of the Ego, arranged each in its proper place in the long sequence from the protozoan to the modern man, are striving to grow at the expense of their environment. Egoism is the distinctive mark of the imprescriptible relation between the most completely differentiated forms of life. In order to preserve and to develop the living Ego the activities of the consensus of organic interdependence provide for the shaping of the personality at every stage of evolution.

FREE WILL

It is true that the illusory sensation of freedom from control which we call 'free will,' and which depends solely on the fact that the governing reactions of subliminal life escape the notice of our senses, cannot help strengthening the conception of an Ego absurdly emancipated from the effects of phenomena. Consequently, that is the very spot where the metaphysician lies in wait for us with his classic question of determinism and freedom.

'Personality,' he will say, 'can have the value with which you endow it only if it is made responsible for its actions, which is inconceivable unless you allow it liberty of choice.'

Let us see what that means.

The 'free will' of our metaphysics is first of all supposed to have the character of an effect without a cause; that is, a phenomenon unlike all other phenomena — something that we have never encountered. In other words, our personality, determined by phenomena described as causative, would have to be an ultimate cause without ever having been an effect, which is the case of the divinity. The argument will be urged that, theologically speaking, divinity is the ultimate cause of all things. In that case, divinity, having complete liberty, should assume the supreme responsibility. In short, God alone is responsible for all things, but it is man that suffers. Any one can see at this point how ingeniously the invention of the 'free will' of man serves the purpose of diverting from God the responsibility for the evil he has caused.

As we are not divinities, on whom or on what do we depend? Determinism establishes us as dependent on the phenomena of which we are the product. Religious metaphysics claim that we are 'free' — that is, without dependence — yet at the same time makes us dependent on its God, who punishes us with a heavy hand for the crime of being as he made us.

It has become impossible to deny that the world is a series of coördinated phenomena, since no one so far has showed us any original phenomenon — except God, who eludes all experimental observation and is, in fact, nothing but a word, bearing no relation to fact. To metaphysics, then, belongs the task of explaining a liberty of which we are the organ, but which is absolutely dependent on a universal cause that constantly exercises its arbitrary will upon our destinies.

You maintain that we feel ourselves to be free? Well and good; but are we free? That is the kernel of the problem. For years we have been told that our sensations of objects are merely pictures more or less faithful to the originals, and that it is important that we distinguish between the image and the reality. I will not dispute it. However, when all our observations agree and are confirmed by every available test, sensation can be regarded as provisionally verified. The problem is to know whether in the case of free will the stipulated condition is fulfilled and whether we are really justified in inferring the reality of liberty from the sensation of it. Now, in that sensation we find nothing except a complex of simultaneous or successive sensations which seem to have some sort of unity only because they belong to the same coördinated organism. To maintain that we have the sensation of freedom is, by a transposition of terms, equivalent to concluding that, because we are unconscious of them, the phenomena of subliminal life are non-existent. To express one's self correctly one should say, not, 'I have the sensation of my freedom,' but,'I have not the sensation of my dependence' — something decidedly different. It is all the more different because such 'freedom' puts us in the

position of a 'first cause' dependent on a still earlier cause, which is manifest nonsense.

Whatever has been said for and against the conditions that have made us what we are should be relegated to the rank of fancies. It is the nature of misconceptions to end by plunging one into even thicker obscurity, no matter in what direction they may start. How can we better get back into the full daylight than by reverting to the constituent elements of the problem reduced to terms of their original simplicity? Too many psychologists have formed the habit of hunting for their Ego in the moon and often of thinking they have found it there.

Simply putting the human Ego into its place in the evolutionary series of organic Egos immediately brings us back to the natural point of view of elementary observation. An Ego can be nothing else than the brief expression of a living organism. From the infusorian to man is only a matter of degrees, since the unity of the organism creates the unity of a synthetic sensation in the individual.

As to wondering whether the individual thus formed is *free*, that is, originally independent of the forces that have produced it, the question (in other respects contradictory) is as applicable to the infusorian and to every other member of the series of living things as to the highest exemplar of humanity. What can be done? If proved facts dictate the answer, we are powerless in the premises. Freedom assumes an Ego independent of its elements, which, like God himself, shall be able to make its own sovereign decisions, regardless of any antecedent phenomenon. That is the function of the metaphysician-made *soul*. All we have to do is to ascertain whether and how such an Ego can be made to agree with observed facts.

The question of free will presents itself throughout the whole length of the animal scale precisely in the same terms as in more or less developed man. The reactions of the exterior world, controlled by the organism, occur under identical conditions and accomplish identical results. In every case the thoughts, the emotions, the volitions, together with the

ensuing actions, are biologically of the same kind, and spring from the same organic activities. If one being has liberty, the others must have it also. If determinism exists in one instance, determinism must exist in all.

As every one knows, when we exercise our will power, we make choices, that is, restore an interrupted equilibrium, wherein the stronger impulse or motive invariably overcomes the weaker. Plant movements occur under the same conditions but as the effects of direct reactions, since their organic sensibilities are less differentiated. In the animal scale sensibility increases in scope and in acuity according to the degree of complexity in the organic phenomena anatomically and physiologically conjoined. From the plant to the animal and from the animal to man there is no change in the phenomena. This is true to the extent that education is nothing more than charging the positive while discharging the negative pole. This is the only foundation underlying the breeding of every living species for predetermined ends.

It took the metaphysicians to tip the scales by throwing the theory of a soul into the balance — and for the ignorant, 'soul' is still a most successful 'explanation.' Vesalius was condemned to be burned at the stake for the crime of being an anatomist. The reformer Calvin had Michael Servetus burned alive because, long before Harvey, he had caught a hint of the circulation of the blood. And in spite of so many stern measures the soul and its free will are still in peril. Man, like Buridan's ass between its two bundles of hay, can make no other choice. In the oscillations of the empirical scales, man's choice will differ in proportion to the ultimate attraction of an idealism in process of evolution. Organic phenomena are always linked with the laws of the universe, and instead of two cosmoses we shall never meet but one.

From the human point of view, whatever may be the determining causes of its activities, the free Ego will remain in the social scheme either a constructive factor to be encouraged or a destructive factor to be suppressed. Our human responsibility is merely the natural result of the re-

actions of the actions of the individual upon organized society. Will disorder be checked? Yes. To a greater or lesser degree according to circumstances, but there will be no occasion for any supplementary proceedings in eternity. As to the metaphysical responsibility of a being, at once sovereign and subordinate and simultaneously independent and dependent, I can see nothing except the art of reconciling contraries which can help it to become more obscure.[1]

Well, no; it is quite a different matter to be free — that is, to act from no cause outside ourselves — from simply living unconscious of the organic forces that govern us. As an attribute of divinity, freedom has at least one characteristic which it is impossible to mistake; God does everything he wants to do, because there is nothing stronger than he. As an attribute of man, dependent on his organs, and through them on the workings of the world from which they are derived, the term 'free will' is the grossest misnomer. Man is no more free from the conditions of his life than from the conditions of his birth, and all existence is in the same predicament. To preserve and aggrandize himself the animal makes decisions that differ no whit from my own, for no more than I has he any appreciation of the organic processes by which he is governed. All subliminal life in the creature is by definition unconscious, but he is nevertheless subject to the invincible law of its determining power. How can we expect our 'free will' to be derived from this inflexible determinism, so clearly manifested in all mental disease? 'If man were free,' said the Abbé Galiani, 'God would cease to exist.' That is obvious. How could there be room in the world for two simultaneous omnipotences? Alas! We are reminded at every corner that we are dependent.

The problem of the Ego is simply the problem of every organism that, in order to put its constituent parts into

[1] Another point. At what moment do we receive the mystic gift of free will? Is it at birth? No one would care to maintain that we begin the exercise of our freedom when we draw our first breath. At what later moment, then? And how is the transfer managed? By what are we to recognize it? The question has long been asked. We are still waiting for the answer.

action, must concentrate its efforts in a consensus determined by the universal law of least resistance, which under the name of 'will' directs the synergies. We are what we are because our sense of the whole dominates our sense of the particular, and because without in the least weakening our personality we can be thoroughly aware that our actions are predetermined, and yet pay no more attention to our sensation of having free will than we pay to the stick that appears to be jointed when seen through water, but that we *know* to be straight.

Abbé Galiani, who has specifically set forth that view, concludes that for the good management of society and of those things for which it is necessarily responsible the important point is that we should feel ourselves to be free — that is, that we should be unconscious of the limits of our functional activities. If he is not the first to have made that observation, at least he has the merit of having set it forth with beautiful lucidity in a letter written from Naples to Madame d'Épinay, whom he asked to pass it on to Diderot. I quote the principal passage: 'The belief in liberty is the essence of man. We may even define man as an animal that believes himself free; that would be a perfect definition. . . . Is having the persuasion of freedom the same thing, as a matter of fact, as being free? I reply: it is not the same thing, but it produces the same moral effects. Man, then, is free, since he is strongly persuaded that he is so, and since that is worth quite as much as liberty. If there were a single free being in the universe, there would be no God; there would be no longer any bond between beings. . . . The conviction of liberty is enough to establish conscience, remorse, justice, rewards and punishments. We shall prove, then, that we are not free, and that we shall always act as if we were.'

REACTIONS

The dominating fact is that a personality conscious of itself and of the world, with all the resulting consequences, is set up. In terms of the universe as a whole, this may be a quite insignificant incident, but from our point of view it

is the highest destiny of an organism whose reactions afford us the gratifying sensation of playing a part in shaping our own destinies.

In the course of a development unlike any other, human personality from the beginning took a prominent, though always subjective, place among planetary phenomena, and he who proclaims this discovery has ample reason to be proud. He feels that the world lives in him. Imperfectly as he may previously have known the world, he is eager to comprehend it, or at least to watch it. He appraises it; he tries to adapt himself to it. The stars are his familiars, for they were created, as people have told him, to serve his ends. He measures the infinite with his own yardstick. He ventures to predict how phenomena will interlock, and he can label to suit himself a system, hypothetical or verified, of the dynamisms of the universe. To hear him talk you would think he had been made lord of creation, and that he intends to use or to abuse his power, which unceasingly drenches the earth with blood, in the fictitious realization of the words of justice and charity. His imagination eagerly plumbs every depth of the unknown. Even before he is able to observe, he begins to set up for his own special use a doctrine of his 'dominion' over things — a dominion that consists chiefly of a disguised submission. If he is obliged to recognize a power superior to himself, he will not fail to put himself under its wing. He evokes it, he wills it, he creates it. Hence, his autocracy on earth will be based on a voluntary servitude. He will consent to be tortured in the night of everlasting time rather than have no voice in the management of the infinite. And if the wheel of his triumphal chariot crushes a few bystanders as it passes, he will, like his own Providence, resignedly accept the harm that he has done.

With all this in process of accomplishment, must not man, in order to reap the full benefit therefrom, cling obstinately to the general outlines of the picture that he drew for himself in the days of his ignorance? You purpose to show him his mistakes, and to point out the vanity of his

dreams? How can you expect his answers to be anything but outbursts of brutality? He has felt his personality too long before understanding it to be able overnight to localize it, to control, to regulate it, and to make it conform in a general way to the data that he has lately acquired. He considers himself a demigod, and you purpose to degrade him to the rank of a superior animal. In his eyes he is an immortal in an ocean of felicity, and you ask him to accept death on the unpleasant pretext that such is the last of the incessant transformations which his person is to undergo. Torments adequate for your chastisement have not been devised. Insults, blows, wounds, all the refinements of ferocity — he will overlook nothing which will assure him the victory of what has been *said* over what *is*. Treachery will have a free rein in the hue and cry [1] of his rampant rage. Happy he who shall have known only disdain or indifference, and who has been requited in kind.

And, furthermore, who shall say that the noble men who were the first to fall in the long battle are not the most fortunate? They anticipated beliefs now currently accepted. They strove for a real existence and to live their own lives in intellectual independence. Is it nothing to have performed the invaluable work of enlarging and elevating human personality?

This Ego which obtrudes itself upon our notice — an Ego alternately weak and strong and suffering from contradictory impulses — has in the past acquitted itself so well on the battlefields of knowledge that as it marches past us, whether staggering or crowned with the laurels of a distant ideal, we owe it the tribute of admiration. How fleeting, yet how dazzling is this drama of personality unceasingly integrating and disintegrating in this infinite world, whose activities disintegrate only to reintegrate! It is what gives man — human projection from the immutably intermeshed, incommensurable universe — his ideal supremacy. How

[1] I cannot help thinking of Erasmus at Bâle, refusing to welcome, and later even flouting, the noble Ulrich von Hutten when he had been attacked for having dared to say what the author of *In Praise of Folly* had insinuated.

inexpressibly beautiful even the meanest creature becomes when in the name of human will power he stands erect before the infinite universe! As a spark can be struck from the humblest pebble, so in this imperceptible life the sensation of the exterior world leaps from the profound depths of ourselves to produce the flash of human consciousness in the dull glow of our brief day.

Thus will come about in the very depths of our being the marvelous phenomenon of an idealism of those things of which we ourselves are an element, formed, lost, and refound turn by turn. Thus, this Ego, which is as elusive and as hard to grasp as the waters of a flowing stream, will ultimately take up its allotted duties in the infinity of time and space. And so, too, the Ego, being fluid, will penetrate even to the relations, that is, to the action and reaction of phenomena, and will supply explanations which will take their proper places in the subjective classifications of knowledge. And thus, in the expansion of the Ego, as keenly felt as it is impossible to measure, the planet at its maximum power comes to think of itself objectively and to take an active part among the conflicting elements of the universe. Thus, man's subjective supremacy, bulking ever larger, will unroll inexplicable glories, while the mob, fresh from its ritualistic splendors, will not pause even to watch itself in the act of fabricating the true, the sole, subject for wonder.

If our metaphysicians had paid but the most superficial attention to the successive stages of the Ego in the world, they would have avoided all the troubles into which their theory of a soul has brought them. What of it? Is it not the law of our understanding to arrive at human truth through gaining knowledge bit by bit, and through misconceptions more or less slowly corrected? Why, then, should we be astonished at the mistakes into which the first flashes of our premature conclusions plunged us? Must we stubbornly insist on living our mistakes, regardless of the fact that observation has demonstrated our errors? It is as though, while admitting that a stick is straight in the

air, we persisted in claiming that it is really jointed, because it gives us that impression when we look at it through water.

To be sensible of ourselves before we can disengage the outlines of our personal Ego from the mass of organisms; to interpret ourselves with approximate accuracy after having misinterpreted ourselves — such is our fate — much aggravated by our hallucination of a realized abstraction from which, as we shall soon see, that figment of sound which we called the gods, sprang up![1] If we stumble too often we become chronically lame.

Untrammeled by any criticism, misinterpretation first of all did its work, seizing upon man, whose child it was, and by main strength imposing itself upon him on the authority of the fiction that it had itself created. From that moment we find every idea of the world and of man falsified. Bursting from its shell, the Ego, distorted, hypertrophied, exacerbated, projected itself on the photographic screen of our sensibility in the shape of an anthropomorphic divinity. And man, delighted with the spectacle that he had staged, prided himself on stubbornly disregarding facts. To dream instead of trying to know is a miraculous path, alluring to minds fatigued at the mere prospect of effort — a too easy descent into Avernus, down which we run with closed eyes.

The Ego of metaphysics, because it is immaterial and therefore beyond the reach of experimental science, mounts a throne of words ensconced among accumulated fogs.[2] Slower to become conscious of itself, the Ego of organic consensus, which is constantly developing, will, however, take its place in a swiftly moving succession of vital activities coördinated by memory into hereditary associations, from which springs an inclusive sensation of unity.

Atavistic complexities, the reactions of educational train-

[1] 'The imperfections of languages are the greatest obstacles in the way of the progress of knowledge.... We speak before we have learned, and we dislike simplicity.' (Condillac.)

[2] Maine de Biran, reformer of metaphysics, tells us of 'the soul outside the Ego,' and of 'the soul that is not the Ego, but the subject objectively conceived.'

ing, every circumstance favorable or hostile to many an unforeseen combination, alternately make the same Ego in its successive activities different or even contradictory — to the amazement of every one interested in his own development. However, heaven and earth are no more concerned at its death than they were at its birth. The wise man who has prudently taken his own measure is not troubled to find himself of imperceptible importance in the sum total of the universe; and not to overemphasize one's own importance is one of the greatest of human achievements.

On the other hand, man should not underrate himself. Do you mean to tell me that, because of the clashes of world-forces from which we derive our consciousness of things, thinking man may attain only a weakening servitude to the whims of his gods? Does not the abject submission of the patriarch to the behest of his sanguinary God, commanding him to sacrifice his only son, indicate but too clearly a life of subjection, sanctioned by intangible rewards and by pitiless punishments — a life spent in perpetual terror lest obedience be not sufficiently abject? Try to take its young from any animal, whether strong or weak, and you will see whether or not the little one will be defended. Who suffers by the comparison?

Doubtless our fate is to live in obedience to the relations of things, the unchangeableness of which creates our law. That also is submission; but to submit to the law of gravitation or to any other natural law is only an acceptance of the conditions of our existence, no more humiliating than the fact that we have not a hundred arms like the fabled Briareus. Acquiescing in universal conditions and voluntarily abasing one's self to the point of obeying the whims of an eternal tyrant are two quite different things.

Who, then, will tell us the romantic history of this Ego on its way to unknown destinies, from its ancestor, Pithecanthropus, who perhaps first knew astonishment when he felt stir in him a more precise sensation of the elements, to that great simpleton Alexander, who, proclaiming himself the son of Zeus, drew down on himself the raillery of his

mother, who pointed out that he risked bringing upon her head the ill-will of Hera. Shortly thereafter the deified Roman Emperors made their appearance. We still have with us to-day the Dalai Lama of Thibet and the infallible Pope of Rome, both of whom are extremely proud of the divinity with which they are endowed. To be or to seem? They have made their choice, and we have made ours.

The authors of the deified Ego cannot consent to put man in his proper place in the procession of phenomena. Merely to emerge from the evolution of cosmic forces does not seem to them genteel enough for the descendants of a first ancestor who fell. They claim that we belong outside the elemental cycle, even at the risk of eternal torments. Likewise, what anathemas do they launch against him who, born of the noble Earth, takes pride in having felt, known, and lived the throbs of the Cosmos, and is satisfied with his share in them!

Amid his contesting strength and weakness man arrogates to himself the right constantly to express himself, to pity himself, to glorify himself. Striding up and down the stage like an actor who has lost himself in his part, and who actually believes that he *is* the character he plays, man dares to say that the world was made for him. He claims that he made the sun stand still; that he divided and reunited the waters so that his tribe might pass. He propounds the eternal truth and seeks to impose it with fire and sword, asserting that so to do is an act of 'reason.' Man's problem is slowly and laboriously to construct from the confusion which such morbid delusions cause an Ego having its source in organic sensibility, which by reason of his bitter experience of things will reverse the supposed order of importance between himself and the universe.

What is the future of the Ego in this unlimited space, where there are no landmarks other than the moving orbits of stars, with their monstrous bursts of flame that are the alternates of an endless evolution? Human existence is framed in, on the one hand, by the luminous cycle of which we think the atom is the focus, and, on the other, by the

enormous flames that flash across the nebulæ in process of transformation into solar masses. Lost in space and time, we have the right to use as data for our knowledge our experience of planetary evolution. As soon as man has taken his first steps along the path of his prophetic destiny, his dreams will suddenly and gloriously soar from mere initial efforts toward knowledge to incomparable flights into the realms of thought.

Born of the first manifestations of life, the primitive organic Ego responds with a simple contractile reaction to exterior excitation, only to lead us through a fairylike avenue of increasing individuation even to the full flower of the thinking personality unfolding before our eyes. In the long train of continually rising organisms we may perhaps find the traits of the future man, whose characteristics will be incipient desire and indications of a will in which the strength and the weakness of the predestined organism will define themselves. How various, how different, how contradictory even, are these constantly developing Egos!

Every one can recognize in himself consecutive states of consciousness that are often quite different one from another. All of them unite in the larger and larger unity of a progressively complex life that step by step accompanies the continuous development of personality. Between earliest infancy and extreme old age what a tangle there is of different and even contradictory activities in the whirlpool of our energy! Is it, then, from those varied, those multifarious, those complex phenomena that our metaphysics has been able to construct the contradictory entity of an immutable Ego, a thing eternally unchanged though always actively changing?

Putting the notion of time resolutely aside, man sets himself to his task of acquiring knowledge as if he had eternity before him. No more than the man of to-day will the man of future ages take into account the short span of his allotted life. Nothing can turn him from his ever-increasing effort to know. Before us the Unknown is constantly receding step by step. Never, indeed, shall we attain 'the ultimate

reason of things,' if anything exists susceptible of such a definition. We shall march on none the less bravely toward the conquest of ourselves and of the universe, without expecting from our quest of the ideal any reward other than the satisfaction of having taken part in it. When we have reached the end of our working day, we shall at least have lived for a moment a life of human nobility unparalleled in the gloomy realms of the Divinity. How many gods, whose achievements ended with their birth, could properly claim to be worthy of humanity?

CHAPTER III

MEN AND GODS

GLIMPSES

IN the last analysis what is the drama of man if not wanting at any cost to master the mystery of things — *rerum cognoscere causas* — by laying a bold hand on the springs of energy?

In the first attempts the word 'energy' was not available as an explanation of any conception whatever of the world or of ourselves. Our mental processes had reached the stage only of the vaguest sketches, and our use of them availed us little. To-day, on the other hand, the abstract term 'energy' represents the highest form of generalization which we can attain. Moreover, to reach that point we have had to replevy energy from the divine personality, in whose bosom under the aspect of a superior will we had at first installed it in order to assure the activities of the Cosmos. Energy thus represents for us a depersonalizing of Providence, whose rule becomes, not one of will but one of law.

Descartes, although adapting himself to various misinterpretations of life, maintained that the world consisted of matter and motion. Force and matter (to use an old formula) — such was, and still is approximately, our final synthesis of the universe. To-day, however, scientists consider the theory antiquated and superseded by the attribution of a higher importance to supreme energy — something which I have no intention of attacking, for the whole scientific world of our time has vowed to that impersonal divinity a worship such as is given only to God — a point beyond which it seems hard to go.

I will only suggest that, at least for the time being, this positivist cult be not carried to the point of setting up a monotheism of energy; for motion, whether deified or not, implies something that moves, and when Doctor Lebon

triumphantly asserts that he has discovered a 'dematerialization of matter,' I begin to wonder whether the world is not about to go up in smoke, leaving us without any support. At the proper time and place I shall revert to this serious question, for if with our physicists I am careful to adhere to the term energy as a generalization of cosmic motion, I should not without protest let the universal dynamism be dissipated into vague metaphysics.

Energy and matter are two aspects of things which I do not believe our intelligence can as yet do without. Abstraction helps our thinking by detaching for analysis the concepts of motion and of its substratum from each other. It is perhaps a mental process rather than a fact. Motion without something that moves is as incompatible with our observations as immobile matter. We rebel at the idea of a series of movements which includes those of an object that moves itself, or — be it said without prejudice to simplify the thought — of an object that is moved. If the atomic electron is nothing more than a hole in the ether, as Clausius claims, we still take the trouble to put something the nature of which we do not know but which we name 'ether' around that absence of something which constitutes the hole. I raise the point to show that we shall demand of scientific observation that strict accounting which Divinity refuses us.

I have thought it advisable to say an anticipatory word on these postulates of our positive knowledge only because I propose to do the same thing with reference to the postulates of imaginative knowledge, in order to capture at the very moment of birth the gods who are themselves also only a moment of human evolution. They are glimpses of things which may somewhat illumine our path — signposts to be noted before plunging into the starry night of the elements.

THE AWAKENING OF THE PRIMITIVE MIND

Primitive men were fated to begin the investigation of their planet through a procedure derived from their animal

ancestors, who — since the desire to live was expressed in their every effort to adapt themselves to their surroundings — found themselves at first impelled to think to the habitual extent that the opposition of the inorganic and the living world exacted. Thus it is with every being. Much later it was said that we must live before we philosophize. This ambition dates far back and, owing to the hurry of synthesis to get ahead of analysis, has never been wholly satisfied.

Metaphysicians, who excluded all observation, saw themselves forced to grant their immortal soul, their innate ideas, and their miraculous intuition to savage as well as to civilized man — however inadequate a receptacle the skull of Chapelle-aux-Saints obviously is. If, on the contrary, we try to fix our attention on the plain succession of phenomena, we shall easily realize that our first investigations could concern themselves neither with classifying observed facts nor with any subtle metaphysics. Confronted by a dense lack of comprehension, the most scientifically minded man — if there were such a being — could not possibly have conceived the theory of predetermined phenomena. On the other hand, a facile imagination helped people to leap over any obstacle, provided they were willing to risk what lay beyond.

Before man had made any attempt at analysis, unquestionably the first thing which interested him was the movement of things. Could man have been astonished to find that he could move, when he felt himself an independent personality,[1] and when astonishment could not come to him except from a friendly or an inimical world? It was on that precise day that the false hypothesis was started — excusable enough then — that, to reach an understanding of things, the right way was to seek an explanation of the world in man, instead of demanding an interpretation of man in the activities of the universe from which he springs. Since all conceptions of existence were in confusion, man's imperious emotions did not permit his envisaging any

[1] Our metaphysicians have never got beyond that point.

other aspects of the facts. Even more astonishing is the fact that, after the intellectual progress which we have made, and of which we are so proud, there are still persons who ask us to support the same theory to-day.

In any case the profound idea of impersonal force or energy, which was not for many centuries to find expression in an abstract formula, could not at first be definite enough to be reduced to articulate speech. Man knew only one sort of force, energy, or power — and that was his own, which he felt living in himself. His mind could not grasp the distinction between his own conscious will and the ultimate unconsciousness of cosmic energy. Accordingly, primitive man attributed world-phenomena of every kind, as he attributed his own personal activities, to the action of a conscious will. Not that he understood the words 'consciousness' and 'will' as we understand them to-day; but if he had the unmistakable sensation of his personal actions, duplicated, as they were, by his fellow-men and by the animals, and if he could know nothing of any other form of energy than his and theirs, how could he have given a different explanation of the actions of inanimate things than of his own? How, except by recourse to a theory of active personality aggrandized in proportion to the restricted universe of those ages, could he find an explanation which would account both for action which did not originate with himself and for the action which manifested itself through his agency?

From this spontaneously sprang the practice of personifying things — the fetish, resulting naturally from an inevitable interpretation. Thus originated the idea of will power and of volitions exterior to man and dominating him. Everywhere, among all races, you will find the same idea. Darwin, while on his cruise of exploration in the Beagle made a trip to the Andes and tells us of an incident which is in point. 'As a result of the elevation at which we found ourselves, the atmospheric pressure was much less, and water necessarily boiled at a lower temperature. . . . So the potatoes (after being all night on the fire) did not cook. At

which my travelling companions exclaimed: "This cursed pot doesn't *want* to cook the potatoes."' The point is clear, and it is hardly necessary to go all the way to the Andes to find civilized beings who are apt to attribute to inanimate things a will power like that by which they themselves are animated. The habit has had so powerful an effect on our language that we still hear such expressions as: 'This door doesn't *want* to shut,' and 'this wood doesn't *want* to break.' They are now no more than metaphors, but once they were 'explanations.'

And when the improvement of language, permitting greater nicety in the expression of thought, ultimately provided the imaginative power to formulate abstractions, how could man keep the abstractions induced by the magic of words from becoming realities, from being personified as independent entities, that is, as divinities? It is a vulgar fetishism which lives on in our modern amulets; and we shall find that the first effort of metaphysics was to distinguish the talisman from the 'entity,' the 'genius,' or the 'demon' which gave it its effectiveness. By whatever name the God of the future was ultimately to be called, he had already been endowed with a name, attributes, and life by those forms of mental evolution of which he is the product.

And yet, to reduce terrestrial and celestial forces to terms of will cannot be the final solution, for man would then arrive only at a tumult of unrelated effects, dependent on the caprice of the different divinities — a complete misconception of universal relationships. Without pausing at that obstacle, which it was quite beyond his powers to surmount, man, as soon as he began to think, settled himself in the pride of his ignorance to live a life built of errors reenforced by expected future adjustments far easier to hope for than to find.

Long before the time of Oberon, Prospero, Ariel, and all the other inhabitants of fairyland, our forests and our plains saw many other legendary personages issue from the anteroom of deification. Gods were everywhere, gods first and foremost, imaginary but dangerous companions, of

whom dogma would make us the creatures, although in fact we made them. Just as soon as you find a man, you find a god. From the birth of the first god you can date the moment when the anthropoid definitely became a man. The solution of problems — so intellectually dull, but so fecund in emotional excess — by divine action was the first to present itself, which does not mean that increased intelligence was bound to accept it. Gods were needed, even though there didn't happen to be any. We had them; we have them still, and we shall continue long to have them.

Hardly had man, facing a world that overwhelmed him, undergone initiation into nascent intelligence, before the law of his being subjected him to the domination of imaginary personalities — a domination destined to last until he was able to react to the universe along the line of facts. What a price to pay!

Was it not inevitable that the indefinite emotional developments of our remote ancestors when they began the lispings of thought should slide down that incline? To those ancestors the world appeared to be, as it actually is, a conflict of powers, and how could they avoid personifying them? A whole race of fairy people supplied the delights as well as the terrors of human dreams, while man was waiting to learn to think logically. Surely this is the origin of those miraculous supernatural beings, genii, ogres, giants, good and wicked fairies, hobgoblins, sprites, gnomes — figures of legend and fable which still predominate in the first intellectual activities of our children, who, like their elders, love to dream. Neither religion nor science has been able to deprive the old tales of their charm. They owe nothing to constructive thought. The *caput mortuum* of vanished dogma, they have preserved the enchanting bloom of primitive imagination and are more vital than many an illustrious divinity.

Such was man's ordained fate when, in the whirl of emotions that bore him toward the unknown, dazzled by the spectacle of worlds revolving in space and time, a prisoner of his earth, shackled by its laws, a stranger as yet to the appeal of the organic reactions which later resulted in the

forward march of human knowledge, he could not but begin by fashioning sovereign powers, even though later he might dominate them.

SETTING TO WORK

Any one can easily understand that the original problems could not have presented themselves to the budding intelligence of man in the clear and simple terms in which modern thought presents them to us. How did the incommensurable development of life — first appearing in vegetable form, then in lower animal, and finally in higher animal and inferior human form — progress? Ultimately, while problems of generalization, of abstraction, and of interpretation presented themselves, it reached the first stage of *homo erectus*, who for a long time yet was to stoop low toward the earth. The last stage was that of *homo sapiens*, who was the first to enter into emotional relations with his god.

Man (Model A), thanks to his organic development through many generations, appears to have possessed a rudimentary power of understanding, but only within the limits of such primitive mental activity as the earliest fossilized skulls show him capable of having achieved. This is true of those superior anthropoids from which man is descended.

This new man, questioning, groping, erring, and persevering, without other help than a stone or a severed branch, pushed forward to hazardous destinies through the progressive march of mental evolution. Along with the first tools which the men of remotest antiquity used, we find works of theirs which show a scrupulous, if empirical, observation as well as an effort to attain the harmonies of beauty.

Of the precious history of that progress there can remain only vague traces. Our task is to assemble them, if possible, in their proper sequence. What we can say now is that, for our purposes, the best arrangement of relationships requires classifications, the subjective aspects of which, as we can clearly see in the case of the supposed origin of species

according to Cuvier, too often escape us. On aspects of the unbreakable chain of life, the genius of Lamarck, and also that of Darwin, has, through fruitful methods of investigation, thrown a flood of light. And, too, comparative philology, in its studies of the relation between word and thought, has cleared the approach to the origin of language.

The skull of Chapelle-aux-Saints which Professor Boule — whose mind has a temperate boldness — claims is not less than some dozens of thousands of years old seems to indicate that man had not yet reached the development needed to grasp even the outlines of the great problems of modern times. The various stages from vague aspiration to precise formulæ we cannot reconstruct.

Even after the recent discoveries of human paleontology, we are still only at the stage of setting up hypotheses on the development of mentality in the early organic state of the first men. We have skulls, skeletons, tools, even reproductions of faces, that tell none too clear a story of primitive groups gathered about caves for the purposes of a family life that might easily become tribal. All those remains of lives past and gone, in comparison with which the savages of to-day are types of an arrested evolution, we must examine with due care in order to gather together all legitimate testimony. Compare, in the admirable book by Boule,[1] the erect skeleton of the Australian of to-day, lowest in the scale of existing savages, with the reconstituted skeleton of Chapelle-aux-Saints. The curvature of the radius and of the femur, the obliquity of the pelvis and of the tibia, the occipital cavity, which is still at the back of the skull as the posture of the quadruped requires, show plainly enough that this primitive specimen of our species had not yet come to stand erect. For a long while, no doubt, the two postures alternated, as they alternate in the case of our large anthropoids, until the time of the imposing carriage of the standing man arrived — a carriage which

[1] Boule, *Les Hommes fossiles*. The plural is needed here to hold open the question of the multiple origin of the human creature — in spite of the Bible, which makes all races come from an identical source.

the shrinkage of old age, through the relaxation of the muscles, brings back to approximately its primitive condition. So the Theban Sphinx, echo perhaps of we know not what memories, used to remind men in her riddle.

Concerning the skull itself, where the balance of the head in the erect posture obliges the occipital cavity to be carried forward, Boule remarks most enlighteningly: 'Among the anthropoid apes the exterior surface of the frontal lobe represents thirty-two per cent of the total surface of the corresponding cerebral hemisphere. Among contemporary men the proportion is on the average forty-three per cent. In the case of the man of Chapelle-aux-Saints it is about thirty-six per cent. From the point of view of the relative development of his depressed and narrow frontal lobe, the fossil man is to be placed between the anthropoid apes and the men of to-day, and even much nearer to the apes than to the men.' From a careful study by Boule and Anthony of the endo-cranial moulding of the man of Chapelle-aux-Saints, I quote the following conclusion: 'In point of the abundance of cerebral matter the encephalos of the fossil man of Chapelle-aux-Saints is already a human encephalos. But that matter still lacks the superior organization which characterizes contemporary men.'

According to those authors, the man of Corrèze, because of a slight cerebral dissymmetry, was probably already unidextrous, like the Neanderthal man and the man of Gibraltar. Judging from the state of the anterior parts of the frontal lobes, which are necessary for intellectual life, we can still regard it as probable that the man of Chapelle-aux-Saints and the Neanderthal man could have had no more than a rudimentary mind, superior indeed to that of the present anthropoids, but vastly inferior to that of any of the contemporary human races.

Thus the fossils which have so far been discovered indicate that we are confronted, not with the famous 'missing link' between the ape and man,[1] but with an incalculable

[1] I use this current formula for the sake of brevity, but do not deviate from the position that man did not descend from the monkey. The scientific doctrine is simply that man and monkey are descended from a common stock.

series of transitions, all necessary before the anthropoid could become human. What could there have been in the cranial cavities of those first specimens of men? On that point we can probably do no better than guess. Nevertheless, we know the point of departure and the goal. Certain landmarks help us to trace some portions of the path.

To judge by the evidence now before us, incalculable time was required for man to reach a cerebral development capable of grasping the idea of causation. And how shall we describe the more or less concordant evolution of the power of understanding? The information derived from paleontology goes hand in hand with the investigations of philologists concerning the origin and growth of language. However, we can form no idea of what were the phenomena of speech of the man of Chapelle-aux-Saints, especially when we observe that his frontal lobes more nearly resemble those of the anthropoid than those of the human being of to-day. He may have been able to utter expressive sounds. Was he already groping his way toward articulate speech? Our modern savages are too much his superiors to help us in judging him. How are we to assume that he tried to express himself in his first encounters with the world? Were his first attempts onomatopoetic monosyllables? Probably. What prepared the way for them? What thoughts did they describe?

On the other hand, word and thought are so closely related and react so strongly on each other that an account of their corresponding activities will shed a helpful light on the development of progressive mental tendencies. The evolutionary variations in the concordant life of word and of thought may perhaps allow us to avoid some of the most serious blunders which block the path of our progress.

In one form or another, gods appeared as instinctive answers to the first inquiries elicited from man by the changing aspects of sky and earth. That was the mile-stone which marked man's transition from a purely animal state to a state of cerebral evolution leading to civilized life. Animals have no gods, or, rather, they have no god except

man, who invariably treats them as he himself is treated by that pitiless 'providential' benevolence in whose hands he has placed his destiny.

Familiar as we are to-day with philosophic systems, we can at will frame general formulæ for the questions and answers propounded by the weakness of ignorance to the sovereign power of absolute knowledge. No such ability could have existed in the rudimentary comprehension of scarcely human anthropoids. The first impulse of the first inarticulate man, innocent as yet of any idea of systematic observation, having in fact scarcely escaped from the pithecoid stage, was undoubtedly to prostrate himself in animal submission before every disturbance of earth and sky. With hands outstretched, head bowed, knees shaking, what could man do before the celestial menace except abase himself? Whether permanent or intermittent, the terror of our domestic animals before an angry master undoubtedly reënacts the prelude of man's first intelligent effort to devise, regardless of price, some *modus vivendi* between himself and his god.

The rock that fell, the stone that cut us, the branch that caressed or whipped us as we passed, the beast that stung us, bit us, struck us, or nourished us, marked for primitive man chance encounters with 'wills' with which he had to come to terms. When natural powers have once been deified, there ensue collisions between opposed wills from the consequences of which, by virtue of prayer, the weak were sometimes spared. Thus good gods and bad gods were born from a chance spasm of pleasure or of pain. And man's first religious impulse perhaps took the form of a gesture or of a cry long before his halting tongue could give a name to the power that his gesture or his cry sought to placate.

LANGUAGE AND THOUGHT

Cratylus to the contrary, the science of language is essentially a modern product; a fact that does not prevent the magnificent domain it has appropriated to itself in the his-

tory of speaking and thinking man from constituting one of the finest conquests of scientific knowledge. One need only consult the remarkable teachings of a man like Max Müller to discover some of the marvelous trails that human evolution has blazed. Learned critics can but admire.

Although summary outlines are inadequate, I wish to limit myself to a consideration of the salient aspects of the delicate relations between language and thought. It is out of the question here to undertake the scientific study of them, except when vital words can be seized upon in their mad rush from man to man, from tribe to tribe, from continent to continent. Man speaks and man is spoken to; it is like a game of tennis, in which the ball flies from one racquet to another, obeying complex directing forces whose trend often eludes us. To undertake to analyze the subtlest activities of thought in order to deduce a coördinated relationship is a laborious undertaking. We can only admire any one who dares make the venture, and we must not lose sight of the fact that the best tribute we can offer is considered criticism.

When we are told that, thanks to language, man is the one being endowed with the vocal power to express the infinite shades of thought unknown to the animal, there is, and there can be, no argument. But if any one claims that articulate speech — which is our distinctive characteristic — is a gift of Providence, not subject to the law that governs the general activities of our organic state, the investigator must not allow himself to be enticed from the strongholds of scientific research.

I may say that when Müller concludes his teachings on comparative philology with the 'origin of language,' he perhaps ends where he should have begun. To admit, with Plato, that many words originated in onomatopœia (in which Renan maintained that there was no more than a simple 'resonance' of the human organism) and then merely to conclude that such a theory is not applicable to our present languages is simply to admit that as yet we know very little about the growth of languages.

Why did not Müller's keen intelligence try, at least inferentially, to bridge the gap that separates us from the primitive articulations which antedate even Sanscrit — for at Sanscrit the ardor of his investigation generally flagged. Savage tribes still exist; should we not do well to examine that field? And again, can there be any possible justification for overlooking the incommensurable span of time that permitted man to progress from the Papuan to Shakespeare? There are so many stopping-places along the road from Tasmania to Stratford-on-Avon! Spurred on by his impelling metaphysics, Müller did not stop to notice the many instructive sign-posts along the road. Moreover, man's problem was simply the process of naming things; the same task confronts every baby; he imitates a sound, not for the idle pleasure of a useless repetition, but — and at this point begins the real mental phenomenon — because he feels the need of a sign which will permit him to invoke its memory for purposes of classification.

That all sensations,[1] no matter how complex, can be expressed by complex sounds is no more astonishing than that they can be expressed by the gestures which, both in man and in animals, accompany the sounds. Please note that I am particularly careful not to confound the cries of animals with the articulate speech of the human species. Nevertheless, with or without gesture, different vocal sounds, or even the sound of wings, more or less clearly express the reactions of that form of sensibility which the organism in action wishes to express. The roar of the lion, the song of the nightingale or of the warbler, the croaking of the frog, the trill of the tree-toad, express, under different conditions, different degrees of feeling. It is useless to call attention to the distance that separates the mere emission of sound from articulate speech.

For living organisms cries are a primitive mode of spontaneous expression suited to the need of the moment. We

[1] Max Müller notes that 'Locke was the first to remark that all words expressing the immaterial are derived by way of metaphor from words expressing sensorial ideas.' Every root denotes a sensation.

cannot match the speed of the deer or of the hare or of the bird. Articulate speech was given us as a partial compensation. Not that birds are incapable of articulate sounds—the parrot, the starling and the bullfinch show that they are; but to them such sounds are only imitative feats quite devoid of the significance which we attach to them. Buffon states that if monkeys could articulate as clearly as a parrot, we should be deeply impressed. Fortunately we have been spared that nightmare. That is no reason for exaggerating the distance between animal and man in matters of expression by neglecting the existing information to be found in the transitions from primitive man to the man of to-day.

Articulate speech is an incomparable instrument of expression, organically adapted to the mental phenomenon of thought, the scope of which it incalculably enlarges. That the simultaneous evolution of our vocal organs and of our associated sensations should simplify those subtleties of analysis which give thought so wide a range, surprises me not a little, but does not convince me that the other functions of the human organism are less wonderful. And I do not feel in the least obliged to regard it as a miracle and to see, as does Müller, 'the hand of God' in this particular phenomenon more than in any other. Man has forced the evolution of his developing organs of sensibility to a point of flexibility capable of expressing the nicest refinements of thought. Does that mean that no thought can exist unless there exists a corresponding word? Some one was sure to advance this theory. Our observation of animals makes it untenable.

An animal feels, thinks, and expresses itself to the extent that its organic sensibilities permit. Exactly the same is true of man. The conformation of the skeleton and of the muscles in a bird permits it to make use of a mode of locomotion different from ours. There seems to be no need of dragging in the question of the existence or non-existence of a 'soul' to account for the difference. The variety of our sensibilities and of the consequent vocal reactions makes possible a wider field of thought in which constantly enlarged and modified methods of expression are always

offering new starting-points from which to discover new perceptions. This is nothing but an everyday organic phenomenon. I am inclined to believe that Pithecanthropus and the man of Chapelle-aux-Saints were able to utter guttural sounds. Exactly what progress they made beyond this, we do not know. But of one thing I am certain: neither Pithecanthropus nor the man of Chapelle-aux-Saints can be separated from the living series in which each marked a stage of evolution, and the Biblical method which sought to isolate the 'first man' from the rest of the world in order to make a 'miracle' of him cannot, after its notable failure to explain man as a whole, be cited as explaining the appearance of a special function.

We must therefore make the best of things as they are. In ways that we cannot now recognize, Pithecanthropus and the man of Chapelle-aux-Saints must have manifested signs of organic transition — perhaps progressing from mere animal cries to the ability to make the articulate sounds which was to be the distinctive characteristic of thinking and speaking man — that is, of man able to express his thought. 'We think in names,' Hegel wisely remarked. The evolution of the vocal and of the cerebral organs is necessarily associated. No evolution is unrelated to other simultaneous evolutions. Do not all evolutions of related complexes now hinder and now further one another? We need invoke no new phenomenon. Why, then, should we become especially exercised over one particular phenomenon, when all we can do with the universal phenomenon, which is the Cosmos, is to try to fathom it?

Müller, who asks us to believe the Bible narrative that man was made from the soil of the earth imbued with the divine breath of life, does not go to the length of maintaining that God taught speech and grammar to the first man. Why not? After all, the invention of language must be either human or divine. Miracles are everywhere or nowhere. No scientific laws of philology can be based on a question mark. Whether we like it or not, the unbreakable bond between phenomena must necessarily lead us from a

proved fact to another fact about to be established. There is no more room for a partial miracle than for a complete one. 'There is in the world,' Aristotle declared — and modern science fully confirms him — 'no piece that is unrelated to the whole, as is often the case in bad tragedies.' If the fact were otherwise, instead of a single universe there would be many, and what would they be like, pray?

Müller had not yet learned from Lamarck and Darwin what stretches of time had to elapse to train and develop the feats of 'Lamarckian habit,' so productive of new forms of activity. From the fact that he traces the phenomenology of language as far back as roots, the sole inexplicable residue, our eminent philologist concludes that there can be no question of any divine revelation of language. 'It is very true,' he says, 'that language has accomplished great things, but it has done so without the aid of the *marvelous*, at least if we give to the word the same sense that it bears in the Arabian Nights.'[1] Are we, then, to infer that there are many degrees of the divinely marvelous? This would be an appropriate time to set ourselves right on this important point. But the illustrious scholar does not appear to be interested in anything which might have existed before his roots. He points out their organic function but refuses to go farther, although he freely admits that if the roots are no longer either nouns or verbs in our contemporary languages, they formerly did duty as such, as they still do in Chinese. Were they derived from onomatopœia, that is, from the imitation of sounds, or from simple ejaculations? To debate the point is useless. Müller thinks he has proved his point because we say 'dog' and no longer 'bow-wow.' We are not interested in whether we say 'bow-wow' to-day, but whether we said it in primitive times, as our children still say it, and as, slightly modified, the Chinese say it.[2]

[1] *The Science of Language.*

[2] 'If the constituents of language were either simple cries or imitations of the sounds of nature, it would be hard to understand,' Max Müller writes, 'why animals have no language.' Perhaps it is principally because they lack the necessary mental organs. If we had wings, no doubt we should fly. But we haven't them.

Basing his argument on Sanscrit, Müller tries to connect with it the first manifestations of human thought. But how many languages existed before Sanscrit? Who will give us the comparative philology of savage tribes? The question how men formed the first words seems to me of secondary importance, since I cannot believe that in the earliest ages they had recognized any governing rules. They did what they could by an empirical leap under the influence of a need that could not be met by what their heredity had furnished them. Since mimicry is one of the sources of Lamarckian habit, it seems certain that onomatopœia was among the first efforts of the human voice — a conclusion strengthened by the numerous traces of it that remain in our modern languages. The parrot, the starling, the bullfinch, and the mocking-bird also mimic. The first step was to name things. That was the first enlargement of the field of human thought. The first problem being to affix to things tickets of sound, one wonders how man evolved the names variously suggested. How many centuries may have been consumed in that task among various tribes and various peoples is immaterial, since time was no object.

Can we infer that, while that special evolutionary task was being accomplished, all the nomadic or settled tribes applied themselves exclusively to creating roots in order that future generations might use and develop them? Assuredly not. Naming was perhaps the decisive act by which the mental activity of Pithecanthropus opened the door of human history. But the development could not stop there. As much alive as their makers, words became living things themselves, with possibilities of future growth. Caught up as they were the moment they were created by dreams and thoughts, they were to react on one another, ever seeking to define aspects of the unknown by classifying them.

How, through the vicissitudes of countless languages, many of which have disappeared after having had a long life, that task was accomplished, we must deduce from facts more or less scientifically established. When it comes to

creating roots for future languages, it will be less a question of constructing a theory than of appreciating the influence of chance happenings, helped or hindered by various exterior circumstances. The only way of bringing speech into existence and of organizing it was to throw sounds at everything, with the idea of fixing them there in order to establish a system of landmarks. Continual and innumerable repetitions, with or without variations, started the mechanism of expression, which became increasingly complex as it became more flexible.

The earliest words were admittedly those designating attributes.[1] The qualitative — that is, the sensation rather than the substance — came next and represented the identification of the object by attributing to it different characteristics. Thus, the sun lights, warms, and vivifies. The sun also dries up, blights, and kills. And we shall find that, although broken up to meet the exigencies of our breath, words (edifices of sound that remind us of the castles which in our youth we built of cards) will form, unform, and re-form themselves in successive groups of which the verb will clearly indicate the shifting relations — relations which obsess our nervous receptivity, which is haunted by the desire for something more subtly analytical than that synthesis termed the 'absolute' to which it first attached itself.

Rudiments of grammar were made, unmade, and remade in an effort to coördinate relations which, when expressed, sustained, developed, and even anticipated the thought in course of formation. Grammar, the unconscious product of the thoughts of many, is, I should say, the masterpiece of the human race, constantly improving itself in the course of an organic and unifying evolution. We shall find that speaking man derived from thinking man refinements of thought which the animal, with its purely animal cries, was incapable of expressing.

[1] We shall see that the adjective 'dyaus' (brilliant) designated the sun, which caused the adjective to become a noun — a fact that later permitted the sun's being raised to the rank of a divinity.

Evolved or not, roots, constantly taking new forms, necessarily vied with one another and consequently diminished the number of those that have come down to us. 'Sanscrit dictionaries,' writes Müller, 'give us five words for hand; for light, eleven; for cloud, fifteen; for moon, twenty; for slaughter, thirty-three; for fire, thirty-five; etc.' What does that mean? We are told that there are 500 words for lion; 5744 words for camel, etc., etc. That simple fact clearly illustrates the phenomena of the life of languages, simultaneously created by all the peoples to satisfy daily needs. Can we find better proof than in current slang, before which at times the most obstinate and hostile purist must bow?

The nature of my subject obliges me to sketch the principal outlines of what we know of the origins of languages — and the origins cannot be disassociated from the sources, and especially from the results, of thought. But just as I have not let myself be lured on by psychology — since, alas, I must prescribe limits for myself — so must I resist the pleasure of lifting the curtain that still hides from too many 'cultivated' persons the magnificent picture of the conquests of comparative philology.

If I have prompted the reader to go farther, he can find no better guide than Müller. For such a reader is reserved the happy surprise of discovering the natural laws of the organic formation of language, whether onomatopœia is, as Renan would have it, or is not, a resonance of earliest man. He will understand why, in seeking to establish synthesis before attempting analysis, we have given every consideration to the false interpretation of words and have been willing to explore every sort of by-road. He will marvel at the infinite complexity of a general progress in which, more or less consciously, every speaking man has contributed toward the great task of developing thought in proportion to the quality of expression that he has given it. Consequently, no one should be astonished that human thought and language control each other, since they are the means whereby man progresses toward his highest evolution. Thus it appears

that the life of articulate language is nothing less than the life of the human being, constantly trying to grow and trying also to get the most out of the life that lies between the thought that is and the thought that is to be.

Our problem is to study the mechanism — that is, the vital activities of language — in the same way that we study the life of the plant or that of the animal. 'From that point of view,' says Müller, 'dialects that have never produced any work of literature, the jargon of savage tribes, the vocal modulations of the Indo-Chinese, and the clicking noises of the Hottentot language are as important as the poetry of Homer or the prose of Cicero, and for some purposes even more important.' Nearly nine hundred languages [1] have been produced by the human organism, all having certain common characteristics which may be grouped, classified, and interpreted, not only according to root-formations, but also according to their constructive activities and their aberrations.

Müller, who quite seriously tells us that man still speaks the same language (or the direct derivative thereof) in which Adam talked with the Jahveh of the Bible, is nevertheless forced to base his conclusions on the anatomy of the vocal organs (of which he is careful to furnish us diagrams) and on the interrelation of their biological activities. I am afraid he will have to be content if we accept his theory, but without distorting its Biblical aspect in an effort to make it more acceptable to a religious public.

Language is a natural mode of expression which by means of articulated vocal signs permits of particularizing, associating, and disassociating human sensations; that is, of weaving sensorial images in the woof which is the sounding-board of our thought. The sensations of animals are sometimes cloaked in silence and sometimes expressed in gestures or in cries that, according to their organic abilities or exigencies, are more apt to be emotional than intellectual.

To bring out fine distinctions we accompany our speech with infinitely varied gestures, the diversity of which sharp-

[1] I do not include dialects.

ens or softens our purely verbal utterances. Without perceptible sound, the amœba distorts itself to get the food that, chemically, tempts its 'will.' In the subsequent links of the chain of life the animal will express its individuality in its struggle for existence by vocal utterances which will dominate the tumult of successful or unsuccessful activities. Our poor, innocent forefather, Pithecanthropus, inherited, increased, and developed that heavy legacy of impressions and emotional expressions, only to transmit it to human generations who in the course of incalculable time have carried it to the point that we, to-day, can recognize. It is a progress in mentality of which the origin is the imperfect coördination of simian habit and of which the result is now the pontiff at the altar, now the scholar in his laboratory, and now the metaphysician who has left so broad a trail.

How could that marvelous experiment have been begun, and how continued to the present day? All that we can know of it lies in the organic functions of the evolving understanding. In spite of efforts by no means negligible, we are only knocking at the door of comparative psychology. Instead of proceeding from the stage of primitive sensation to the higher states of increasing intellect, we have seen fit to compare the states of our human minds with the successive reactions of animal sensibility — a procedure that makes us pass from the complex to the simple, as if we purposely sought to put observation off the track. What surprises us in the intelligence of animals is the contrast between their achievements, so like our own, and the coincident inadequacy of the mental power with which we credit them. We should see in their acts manifestations of primitive understanding, working toward the same ends as our own, and consequently producing analogous effects by inferior means. It is like the peasant who does his reckoning otherwise than by our methods, but who gets the same results. Necessity teaches the bird making its nest how to set its faculties at work to accomplish the necessary results. The same process, though in different forms, inevitably was followed by our remote ancestors in their efforts

at self-preservation. A whole world is passing, or has passed, through the same progressive stages, and has been able to survive only because successive organisms have realized the procedures needed for continued evolution.

It is a severe blow to metaphysics, however, to see animal instinct produce the same effects as that deified 'soul' of which we are the privileged possessors! Might not soul and instinct be in different degrees merely the same organic manifestation? 'You can hang only the picture of a chain on the picture of a hook,' said an English philosopher quoted by Taine. Metaphysics tries to hang its unrealities on the realities of the living organism.

The similarity of the organs requires that the sensations of the animal should be of the same kind as those of the human being. I can see between them only a distinction of degree. We find ourselves at the highest point which evolution has at present attained — a fact that does not prevent certain animals, by many a *diverticulum* of evolution, from possessing refinements of sensation far superior to ours: carnivores, bees, ants, birds, and many others.

We talk and the animals do not. The distinction is fundamental. To make speech possible there must be a power of analysis, whether conscious or not, which permits the use of signs corresponding with snapshot pictures fixed in our brains. It is a spontaneous process of the creative empiricism of language, which originated and developed the power to classify relations, or, in other words, to think.

Try to conceive the mental condition of a being conscious of sensorial perceptions which the mnemotechnics of language do not help him to link together. In such a case how could what we call thought, demanding, as it does, interplay between different states of sensibility, function? The first links of images would, doubtless, remain coördinated in the original series of mental phenomena, but only soon to be separated for lack of rallying points, as is demonstrated by the sudden but short-lived impulses of animals.

Thoughts without words, as in animals, may thus consist

of short, successive impulsions resulting from urgent necessity. To develop them, the power of the verbal sign, vitalized by abstraction and fixed by memory, is needed. 'The function makes the organ,' says Lamarck, in the sense that the spontaneous urge of a need to be satisfied stops only when the need is satisfied,[1] and then only until a new impulse is felt. That is why the organism, as it developed, taught the spider to weave its web and the ant-lion to dig its pitfall. A powerful urge toward self-protection leads the bird to be suspicious of grain scattered in a manner other than that familiar to its experience. Animal conduct is ruled by an inflexible sequence which, from a lack of graduated verbal mnemonics, suddenly breaks down at the least variation from the usual circumstances. That explains why a bee, though only a few feet from its hive, cannot find its dwelling-place if it is not exactly where it was before, and why a carrier pigeon recently placed in my dovecote, returning to it after being two days away, could not find his mate on her eggs, since the oblique entrance, though only twenty centimeters away, required of him a degree of observation beyond his capacity. We know nothing of the marks that guide the migrating bird, which seems to have sensations of which we are ignorant.

Every animal has its call, marked, no doubt, by intonations appropriate to every shade of intercourse. Can we infer from the bird that the speech of man began in a song? If so, words, composed of cadences, would be sounds that, as a result of a higher development, we had ceased to prolong. Research into the gradations of increasing definiteness of speech might show in what direction evolution was progressing.

A very long period no doubt elapsed before the hoarse cries of the primal savage, modulated by many exercises of the throat, became inflections capable of expressing the whole gamut of sensations susceptible of vocal utterance. Resulting from the conformations of different organisms,

[1] So the true formula seems to me to be: 'The need makes the organ,' for the function, that is, the function of the organ, cannot precede the organ itself.

the work must have been carried on in every human group by traits common indeed to every individual, yet different in each.

The important fact is the general spontaneity of the organic proceedings that made each successive race put its shoulder to the wheel under the incentive of a general pursuit of more and more complex vocal combinations to correspond to every subtlety of expression. We can but marvel at the unified power of an organic evolution in which the conscious and the unconscious merged to permit potential man to understand the relation of things to each other. The linking-up of organic phenomena brought about the linking-up of verbal procedures which tend to promote the transition of sensation into thought and so into speech.

Languages are thus the product of a common effort of properly coördinated human wills. Daily we can see how currents of popular feeling coin a phrase which spreads through the community and steers its thought in a particular direction. As languages are the product of related evolution, they will never cease to develop under the continuous effort to understand until that day arrives when, from whatever cause, our destiny reaches its term.

Men of enlightened intelligence have had, and always will have, the greater share in establishing the superior constructive accomplishments of evolution. But it is quite obvious that the great mass of people have through widespread and repeated use succeeded temporarily in forcing the acceptance of its laws of speech.[1] Man was not to progress from slang to academies of grammar until such schools had already become superfluous. All the sensations that produce simultaneous or successive images flow forward in rapid waves and rush by like an irresistible torrent which, through the component effect of coöperation and of resist-

[1] In that sense, theological thought and the first formulæ of speech are two almost simultaneous manifestations of the rule of the crowd — manifestations which a metaphysical oligarchy later planned to erect into a system that was to last until the progress of scientific knowledge could no longer be ignored.

ance, sweeps on and determines the coördinations of our mental life and of our personality.

ASSOCIATED AND DISSOCIATED IMAGES

Any one can see that sensation is composed of vibrations of the nervous system which, thanks to the vehicle supplied by the image, reach consciousness through accelerated perception. Those images synthetize the phenomenon and present it in aspects that permit, and even require, all possible combinations, which we could not arrange or classify if we had not the resource of vocal expression. In that sense the articulate word is the *sine qua non* of thought in men in process of evolution.

Since our abstract ideas (dissociations of images) can exist only through the vocal signs which express them, and since the association of images reveals only the product of repeated sensations, the principal function of words is to coördinate them. The inferiority of the animal lies in its being incapable of abstraction or of speech. Since generalization, which is dependent on abstraction, is impossible without the aid of articulate speech, man became a thinking and speaking being by one and the same exertion of will.

Dissociation (abstraction) takes from the instantaneous sensation certain elements, which are artificially isolated by means of evocative words in order to build verbal coördinations. These are the formulæ of an algebra which gives us subjectively the solutions of objective problems. We know perfectly well that neither a, nor b, nor x exists. Nevertheless, a, b, x, and other symbols of the sort, when considered as values, lead us to cognitive processes which we can relate to objects. Considered from that point of view, algebra itself is merely a system of generalization carried to the point of abstraction. There is this difference, however: algebra is a system to facilitate calculation, whereas abstraction, operating as it does on the sense of perception, has the unconscious spontaneity of an organic reaction.

For abstraction, which, as cannot be too strongly emphasized, is characteristic of the human mind, the defining

power of words is a prerequisite. Animals think after their own fashion, but since they do not talk, they cannot make abstractions and consequently cannot start those currents of thought whereby man penetrates the subtleties of relationships to which animals are denied access.

When Müller admitted that we cannot think without words, he simply recognized that nothing can be expressed unless the representative sign comes into play. What would a thought be without a limiting formula? Naturally, only a brief linking of sensorial reactions, as in the case of animals. In other words, there would be expressive exclamations without continuity, because they lack connecting signs, but which would preserve cogitative value because of their original interrelations. Animals have both the power of observation and of imagination, but no continuous linking-up of ideas could exist until evolution produced man.

Evolution accentuates all the traits of personality throughout the living series. The Ego grows through the stages of generalization (perfected by the procedure of abstraction) which give a flexibility to the imagination that permits us, thanks to the signs that our articulate voice enables us to utter, to attain subtleties of analysis so acute that we shall penetrate still more deeply into latent relationships. Hence, our proper pride in that growing subjectivity which has taken possession of the universe in order to comprehend and to judge it.

We should be no less promptly checkmated than the animals should we try to talk without making use of abstraction. Abstraction, then, is an act of the imagination, an evocation of the unreal by the use of which, as in the case of algebra, we express positive relationships. I venture upon these formidable problems only with the utmost caution. Simple honesty forbids me to evade them.

ABSTRACTION

After we have noted the organic phenomenon and the virtue of a subtle achievement in which the highest effort of thinking man is displayed, what is more natural than to ask

whether the very delicacy of the mechanism does not contain inherent dangers? Will not that abstraction which defines in words characteristics, artificially detached from the sensorial image — such as whiteness, benevolence, virtue, etc. — perpetuate the semblance of an apparent reality beyond the period necessary to the mental operation which justifies it? In other words, will the imaginative effort that by a fictional procedure opens for us possibilities of assimilation in the realm of elements, be able to check its course when it finds its subjective self confronted with the wall of objectivity?

Fundamentally, the abstract word is simply a provisional hypothesis which the law of its effort — and, all the more, the law of its success — inevitably tends to prolong and to establish as permanently as possible. Led on as it is by the facilities of acquired language, will not the same faculty, which by verbal trickery arbitrarily detaches one of the attributes of the sensorial image to make a vocal reaction evocative of an apparently concrete object, inevitably seek to extend the fiction of that incipient realization?

Grammar, which later sounded the first warning, necessarily followed and could not have preceded the formation of language. By the time that man hit upon grammatical analysis as a means of giving regular form to the spontaneous groupings of the mental organism, the habit of attributing consciousness to the unconscious had prepared us for every sort of error.

Thus, quality, fictitiously distinguished from substance by means of a word, was bound to become an objective entity in the coördinations of our thought. That is the last stage. The phenomenon can go no farther, for we have attained that realized abstraction of which Locke speaks, and which through the personification of the abstract was to sire every dogmatic theology and all the ingenuities of metaphysics. It was a vagary of thought. Thought, unaware how easily words slip from one meaning to another, wandered from the right path. That joint aberration of

word and thought was accepted by every one, and every one put implicit confidence in it and developed it indefinitely. Have not even scientists come to the point of talking to us of a 'dematerialization of matter,' and of thus setting up a 'scientific' cult of energy — that is, an abstract term, meaningless except in connection with the very substance apart from which it cannot exist?

As I must discuss the mechanism of deified abstract terms, I trust I may be excused for dwelling on the circumstances of the phenomenon; I do so only in the hope of clarifying the subject as much as may be. It is necessary to go to the very heart of the doctrine of the subjectively grouped transpositions and classifications which give life to our thoughts, and to which for that very reason we tend to give a reality external to ourselves. See what people will say if you tell them that words have no necessary relation to actual fact, and that, because we know the word 'God,' it by no means makes God a reality.[1] Predominantly imaginative persons will shrug their shoulders. But what are they doing, if not falling into the snare of sonorous phraseology expressing the absolute — that is, the inexpressible — by merely denying it all relative qualities? [2] They can fabricate words and worship them, but that does not turn the words into realities.

To sum up: in a thousand unconscious ways we take pains to think of our life in terms of a world of entities, magically substituted for that world of positive fact into which we are born. Man, his own miracle-worker, childishly lets himself be ensnared in the skillful mechanism by which he steps away from reality the better to approach it, without comprehending that his condition requires him to move in the elementary circle within which the law of his being confines him.

By the activity of our imagination, which outstrips our means of attaining knowledge, as well as by the constant

[1] Descartes himself recoiled before the problem.

[2] 'All that can be said of the universal substance,' says the Hindu, 'consists in replying to every suggested definition: "It is not that, it is not that."'

checks of our observation, we gradually approach a more closely knit coördination of interrelations. Thus, our own effort accomplishes the vital evolution of our thought, and the opinions we form from day to day make up the body of our knowledge. The law of man, inseparable from the laws of the world, becomes less and less incoherent in its quest of absolute coherence, access to which is denied to man. What are our most strictly scientific hypotheses but makeshift ladders up which we hazardously climb toward that provisional knowledge which it is our task to consolidate? Such is our present equipment for attaining 'knowledge,' and the quarrel between what we can say and what we can prove still goes on.

How could we better expend our lives than in such a magnificent, yet thankless, task? Is not the inadequacy of our means our title of honor in the workshops of progress? We are told that our God is omniscient, although he has never troubled himself to learn. A doubtful distinction, at best. Since effort, with its joys, its disappointments, and its pains, is my heritage, is not mine also the right to consider my destiny — that of a man striving to grow — as the nobler and the finer of the two?

Knowledge of the 'divine character,' which by means of 'revelation' announces itself as definitive, cannot be progressive, since it will not admit that it can be wrong. The god of primitive man could not be wiser than his human creator, as is evidenced by his utterances. And the same is true of all subsequent gods. If this be so, it is not surprising that the 'science' of our sacred books failed lamentably under the acid test of proof. In sharp contrast we find that human knowledge, which is always relative, although it strays and stumbles, always recovers itself by the aid of constant additions which clear the way to future solutions.

Dogma is infallible — or so it claims. Watch it contradict itself, as man himself does, in all ages and in all lands. It ought to create a universal unity of human knowledge. Yet, so far, all that cults have done is to tear each other to pieces. Meanwhile, experimental research goes serenely

on its way, and on its theories rests that universal consensus of opinion which 'revelation,' with all its grandiloquence, has failed to achieve. The positive philosophy of the world and of man seeks to coördinate generalizations among which metaphysics still runs amuck. Can it ultimately achieve complete harmony in the world of thought? In view of the wide distribution of organic means and of the diversity of human character, I cannot believe it. Relativity and complete unity of thought are too obviously mutually exclusive.

Human knowledge demands the courage to disagree. Our inherited mental divergences are still too varied to be united within any given time into any generally coherent theories that we can trust. Let us face the facts. Contrary to appearances, we shall perhaps find that the difficulty lies less in the doctrines themselves than in the general interests which have grafted themselves upon the doctrines. Loudest voices do not always carry farthest; so, too, of advertised theories of the conscious Ego. Interest and belief are always in conflict; nothing in the history of accomplished progress affords any reason to think that men, since they are diverse, will some day reach intellectual unity. Man advances upon the stronghold of knowledge in open formation; he can achieve a flexible consensus of thought only by a collection of facts scientifically established.

In the field of imagination as in the interpretations of fact our descendants will have ample chance to disagree until this point or that is made so clear that it can no longer be the subject of controversy. Not science, but the church, must be accepted on faith. On matters of accumulated knowledge, which constantly increases, universal agreement will easily become more general and widespread, whereas 'revelation' will find it increasingly hard to gather an audience to overawe. With complete freedom of speech, science will serenely proceed upon its way.

NAMES, PERSONIFIED AND DEIFIED

The heavens, with their sun, their stars, their moving clouds, are visible to all. And likewise the restless ocean, the earth, with its animals, its plains, its mountains, its rivers, its storms. The first impulse of the intelligence, once it had gained the power to speak and had conceived the vaguest idea of analysis, was necessarily to assign names to different things as a preliminary step toward classifying them. The memory of that time survives in the sacred books. In the Genesis of Israel it was man who, by virtue of his articulate voice, assigned those names, whereas in the Indian cosmogonies it was god who gave that first lesson in language to helpless man.

'We think in names,' is a remark of Hegel's that I have already quoted. But what is the basis of the names? The problem solved itself instinctively. What other designation was possible, as a matter of fact, than that which described our sensation? The attribute, the quality, expressing the effect produced on our senses, was, failing any other means of expression, inevitably chosen. The Aryan of the Vedas called the sky 'Dyaus'—that is, the *radiant*, the *brilliant* — a quality used as a name.

The first task was to distinguish one object from others. But, according to circumstances, the same qualifications might also suit other phenomena. The sun, for example, is not the only thing which shines. Thus it is that, entirely without analysis, the adjective was at once promoted to the dignity of a denominating noun. 'Dyaus' became *the* radiant, *the* brilliant. In this way the sky acquired first its individual name and then the outlines of an individual reality. Thus the word 'Dyaus,' which is no more than the name of a dazzling star, passed through the migrations of Sanscrit, into the Greek Zeus, Theos; into the Latin, Deus, Dies, the day, Dies-Piter, Jupiter, the Day-Father; into the French, Dieu, etc. . . . What irony there is in the thought that one of our first gods was merely the luminous vault of heaven (Varuna in India, Ouranos in Greece)! But then, what more does man need to create a divinity?

That casual verbal transposition was no more than a simple deviation of language; but by establishing a dominating name it suggested an active personality. To possess a name is to be individualized, to be vitalized with a special life. What could be more natural than to assimilate the surrounding forces, the tumult of which harassed us, into the personal energy of an Ego, like the one which each of us feels living in the depths of himself?

Rudimentary intelligence enthusiastically took up the practice. And at a single stroke all the energies of the world, having passed, thanks to a verbal twist, from the state of attributes to the rank of persons, appeared as volitions, which dominated man and his universe. A formidable deviation of language indeed, since it caused a like deviation of thought! Automatically there sprang up a primary doctrine of things, soon followed by the obsession of ritual, which was destined to take possession of our whole emotional being.

All that development was the result of realized *abstraction*[1] — 'realized' to the extent of personification — which permitted a mere deformation of a word, representing nothing except a subjective reaction of our own, to assume the appearance of individual existence. The faculty of abstraction — that is, of subjectively isolating a characteristic or a quality of an object by means of a word that corresponds to no objective reality — nevertheless remains a capital asset of language. There are, for example, objects that are *white*; but there is no such thing as *whiteness*. There are men who are *honest*; yet *honesty* is nothing but a name, entirely without individual existence.

Realized abstractions thus became personified, or deified, abstractions. Wisdom and justice, for example, words which express only human characteristics, became goddesses possessing temples and honors. Even to-day they are still re-

[1] The expression is Locke's, as I have already said. Voltaire called attention to that shifting sense in the abstract word. Neither Locke nor Müller hesitated to analyze the phenomenon. Metaphysicians avoid the subject. They try to speak of it as little as possible.

presented by statues, which may have been degraded from heavenly heights, but which yet occupy the modest rank of symbols or allegorical figures — the *caput mortuum* of divinities gone to seed. That is what Locke calls 'mistaking names for things.' How much more dangerous to mistake names for gods.[1]

Max Müller himself, who took such pains to adjust his great learning to the conception of the official God of our times, found himself obliged to affirm the dictum of Locke in these formal terms: 'The nations of antiquity allowed the names of natural objects, such as the sky, the sun, the moon, the dawn, the winds, to take on the attributes of supernatural powers, or of divine personalities. They offered worship and sacrifices to abstract names like Destiny, Justice, or Victory.' How thankful we should be had this evil habit been restricted to 'the nations of antiquity'! The learned mythologist did not care to bring his investigations down to our own times. He did not pay sufficient attention to the vivified statues which old religions left on our hands. Nevertheless, better than any one else, he should have been able to see to what extent abstractions continue in our eyes to be incarnated in the heroes of deified myth. One of the most notable of modern examples is the Immaculate Conception, which is represented in a statue set up for our adoration.

Hence it is easy to understand why Democritus, anticipating Locke, should have likened words to oral statues; that is, to sound-formations clothed with an apparent life, which our unconscious gift of endowing things with apparent reality soon made into divine personages. Can one conceive of a greater confusion than to have statues of abstract terms

[1] It is curious to observe that the human mind in its metaphysical enthusiasm refuses to let itself be deterred by any contradictory fact. Berkeley professed that 'the earth and the universe do not exist outside our minds,' for the reason that, since the qualities are not necessarily in the object what they are in the subject, objectivity is found to be a thing of human creation. 'It is enough,' he says, 'to open your eyes in order to see it.' It is also enough to open your eyes to see that the subject is only an aspect of the object, thanks to which the qualities of both are confounded.

and personalities of deified words! 'Language, the Mother of Gods,' said a German. *Nomina, Numina*, exclaimed the Romans. Of mere names have we made our gods. The phenomenon is so obvious that Hesiod does not even pretend that he is deceived by it. So far from pretending is this Singer of the Gods that he delights to expose stark naked the impenitent candor of a poetic soul at the height of its hallucination by saying: 'Hys, daughter of the Ocean, was joined to Pallas and had by him Ambition, Victory, Force, and Power, glorious satellites of Zeus.' Could one find a better example of how the abstract word drifts into a reality?

This brings us to the origin of the famous dispute of the Nominalists and the Realists, which, in the Middle Ages, lined up against each other those who saw in words nothing more than sounds corresponding to aspects of thought and those who claimed to see in them, not mere names, but images of real existences. The whole scheme of theology was thus put on trial, and in that light nothing in the history of the human mind is more instructive than an analysis, even if brief, of the arguments *pro* and *con*. The future of human thought may be said to have been at stake in that contest. It seems to us to-day that the position of the Realists cannot be seriously defended. In those days things were different, and the invectives and the excommunications which were hurled around prove very clearly that dogma was at stake. Abélard could save his position only through the *distinguo* of conceptualism, and his deplorable end was regarded as the chastisement of Heaven.

Later, Occam, by way of deriding the Realists, with whom he had once sided, amused himself by saying: 'Let us not create more beings than we have to.' Before that time people had created as many as they could. We still continue to create them — jumbled together in a single Ruler who assumes all the responsibilities of the universe, merely to shift them as quickly as may be upon our shoulders.

Is there, finally, a prettier example of a deified abstraction than the lay cult of the Goddess of Reason, glorified by

puerile 'revolutionaries' at Notre Dame who sought to destroy the mental life of the human species from top to bottom? They could find no better Roland with which to match Robespierre's Oliver of a Supreme Being than deifying a faculty of the intelligence — that is, an organic state of man — in the form of a divinity more nearly human than Robespierre's Goddess of Reason.[1] Did revolutionaries ever fail more abjectly? For on these men, remember, the collapse of the *ancien régime* had imposed the duty of amending their own ideas in order to fashion a new destiny for themselves. The sixteenth and the eighteenth centuries had cleared the ground. What do we see emerging from the terrible clatter of words? A system of revolutionary metaphysics, a childish system of metapolitics and deified principles, about which no one troubled to ask whether it was not perhaps less important to cry them from the housetops than to know how man could learn to assimilate them and subsequently to apply them. Liberty, Equality, Fraternity!

Wholly to revolutionize present and future humanity, the Goddess of Reason simply brought out the old trick of illusory visions by which our too fallible power of comprehension has always let itself be led astray. In the hope of discovering a new way out, people once again clamorously ran up the old blind alley of a shallow ideology. The lesson is too significant! The men who proposed to substitute a government of ideas for the old violence of the fallen Divinity, evolved no better method than to worship other words, which produced the unexpected result of maintaining the very effects that they condemned. Instead, they should have put their theories into practice rather than merely to have preached them.

[1] Every one has pointed out the profound conservatism of the illiterate revolutionary, who could not see beyond a change of names or of persons. It is the remark of Shakespeare's Roman over again: 'Brutus has killed Cæsar, let us make Brutus Cæsar.' And Brutus fell for having believed that his dagger would be enough to restore liberty to the Roman people, who would then by their own effort carry through their own revolution, while, as a matter of fact, the bewildered plebeians saw nothing to interest them except a mere change of masters.

There is a colored print from a painting by Boissieu, entitled 'The Triumph of the Republic,'[1] which with touching ingenuousness reveals to us the rationalistic idyl of the time. From the Revolutionary Mount Sinai, the Burning Bush, surmounted with a scroll on which in lightning flashes are written the Constitution and the Declaration of the Rights of Man, hurls the fiery arrows that are to strike the Hydra, symbolic of all the inimical abstractions which stretch despairing hands from the Pit of Hell. Meanwhile, on a rural upland, around the abstract figure Liberty (made concrete in the shape of a tree of Paradise), villagers with eyes upturned to heaven and imitated by a band of children, dance joyously in a ring. Some people may prefer the classic collation on the turf — wherein the realism of ideology eventually declares itself. The only new element in the picture was that the Goddess in the Phrygian bonnet had taken the place of Jahveh — a revolution smacking of a recommencement. When the time came to do something besides dance, 'humanitarian' action could only fall back upon the brutalities which the Church, and through it the State, had taught.[2] As a consequence, the children, leaving their dance, went to die under Napoleon's eagles in the snows of Russia, asking neither why nor how.

The revolutionaries had wanted to free the world. They were unable to free even themselves from the primitive practices which had hobbled them with the cult of entities. The Triumph of the Republic merely changed the name of the idols. Very soon another idol, of brutal personality, was to force his way across the battle-fields. When man has passed judgment on all forms of idolatry, he will perhaps come to be satisfied with himself as he really is and perhaps regret that he did not start with that idea.

[1] Carnavalet Museum.

[2] Let us give the revolutionaries this credit: though they were prodigal of death, they abolished slavery and the torture in which the magistracy of the Church delighted.

MYTHS

To cap the climax, the metaphor, legitimate and magnificent child of the mind, created myths and made them live the adventurous lives of extravagant dreams, which by their confusion and number installed us in the heart of an imaginary world where the unions of gods and goddesses represented humanized cosmic phenomena.[1] Metaphor is only a more or less suggestive comparison that by evoking analogies allows us to substitute the actions of living figures for the successive images which spring from sensation.

Were there no abstraction, there could be no metaphor, and our thought would be without wings; nor could our articulate speech have attained its present perfection. However, there are two sides to everything; we have paid for the beauty of that prodigious flight of imagination by the difficulty we find in checking ourselves on the treacherous slopes where, at the mere echo of sonorous words, our logical faculty loses its balance.

If we are to believe certain authorities, this self-operative trick of language, so salient a characteristic of the Aryan, is not so conspicuous in the Semitic tongues. The reason is that in them the root of the word is such that it does not permit of illusion. In those tongues the idea of abstract power without form or color, and therefore without imagery, remained dominant.

Semitism had no myths in the Greek sense of the word, and, like primitive Asia, it proscribed all tropes and figures; its wingless poetry does not lend itself to that sort of fanciful expression. In spite of that fact, after passing through all the primitive idolatries, it nevertheless personified phenomenal appearances either separately or as a whole — either in monotheistic or in polytheistic form. The structure of these languages seems to me merely to demand that the obscure

[1] The question has been raised whether the Indo-European races originally had the same myths. It would not be wise to enter here upon a problem demanding an exhaustive study of history and mythology. I regret it all the more, because such a study would necessarily throw searching light on the mental characteristics of the races of the earliest civilization.

operations of the mind be carried on in a different way, in order to reach the same results.

As I have remarked, the phenomenal awakes in us the idea of a power which has a *will* analogous to that which we feel in ourselves. To express that idea, the Aryan can dramatize the physical attribute; the Semite, less imaginative, must take the abstract attribute. Because the Semite had no figurative language with which to build dreams, he gave himself (and even gave us) a God less sharply outlined than the Aryan divinity. But this Divinity has squared the account by bringing in his train his Trinity, his Holy Family, and the innumerable company of his Saints, not unlike the legendary heroes of Greece. How often apparently different things are analogous!

As everywhere else, the first Semitic idolatries took the form prescribed by the provisional data supplied by superficial observation. Everywhere, the abstract idea of power brought about the same results, since it differed from mythic anthropomorphism only by the less precise contours of a superior personification, which nevertheless represented the idea of despotic rule with all its brutalities.

Max Müller has helped us to put our finger on the contrast between Æschylus, who shows us 'the rain that falls from amorous skies to fertilize the earth,' and Job, who, speaking in the same sense, prosaically bids his God 'to open himself the bottles of the sky.' What is there at the bottom of this difference? Nothing except comparative richness or poverty of imagery. Similar states of mind, although differently formed, must harmonize if they travel the same road. How much simpler and at the same time how much harder it is to say, quite simply, 'it rains.' [1]

The myth, then, is only the metaphorical fabulizing of phenomena, represented in the form of fictitious person-

[1] 'Jupiter rains,' said the Roman. Our 'it,' although the Christians never bothered themselves about the matter, remains in the phrase to remind us of the pagan god.

In effect it seems clear that metaphor must have preceded abstraction. Regardless of the form it may take, we see the birth of the same phenomenon — namely, the vitalizing of a realized image.

ages and vivified abstractions whose individual actions typify the related activities of the world as they unroll before us. Decharme thus expresses it: 'The myth is the unconscious and necessary act by which the mind of man, incapable of abstraction but not of metaphor, succeeds in making concrete the activities of phenomena and in giving them life as superhuman figures.' The myth is a poem of divine exploits in which man, ever the victim of his own impositions, allows himself to be diverted from impersonal phenomena by words that, implying personality, translate into dramatic action all world-phenomena which at the moment he is unable to study scientifically. For example, does any one fail to recognize to-day that the myths of Demeter and Hades, and of Persephone, whose abode is alternately on earth and in hell, are but the dramatized progress of the seasons?

According to time and place, the same god is the hero of different myths, sometimes irreconcilable, yet often confounded. I have already pointed out that the sun lights, warms, and fecundates the earth, at the same time that it parches, burns, or kills. Different names are needed to describe those contradictions, and, consequently, wholly different fables. Effervescing from human dreams, the stampeding masses of myths rush over and trample on one another; and then, after they have become interwoven, merged, and superimposed, they separate and resume the course of their adventures, the thread of which is often lost. How can we find our bearings in such a crazy jungle of matted vegetation? [1]

In the youth of the world knowledge was poetical; that is, its matter consisted of action which, though fictitious, was indistinguishable from man's actual conception of fact. What a poet really enjoyed was to let divinities drop from his lips as the pearls and diamonds and rubies dropped from the lips of the princesses in the fairy tales. Nothing checked the wild course of those fantastic flights. Poets sang, and

[1] For the history of myths, see the respective Mythologies of Decharme and of Preller.

men let themselves be rapt away in ecstasy. But they had to come back to earth some day, and prose lay in wait for them when they fell.

Can we really be astonished that the morals of Olympus were not exemplary? Could they be otherwise when a simple conjunction of phenomena was translated into a more or less scandalous union between deified personages? In order to explain the immorality of the Greek myths, and the too free unions over which the Christians raised such an uproar, some persons have argued that the believers of those days saw in their divinities only the personification of the phenomena that they represented — stars, clouds, winds, seas, rivers, mountains, forests — the symbolic meetings of which were as foreign to all questions of morality as is a problem in mechanics. So far as the obscure beginnings of myths are concerned, the view does not seem plausible, since that would be reversing the mental operation which created a god out of a stream or out of a mountain. On the contrary, it was inevitable that time would depersonalize the myth. Greek morality, which differed little from our own, but which was perhaps less quick to take alarm, was free from hypocrisy. The same things occurred on Olympus as in the world of men.

In the course of time, as the universal law of evolution exacts, the active faith of the pagan, like that of the modern Christian, doubtless began to decrease. But when the Greek said Ares, Aphrodite, Hephæstos, or Poseidon, he visualized a glorified human being (as the plays of Aristophanes indicate), and he wanted that being to be human from every point of view. Why be astonished at the casual amours of Zeus, or at the famous surprise of Ares and Aphrodite, caught in the golden net of the outraged husband? Like organisms imply like functions.

The evolution of morals has been recognized long enough to permit us not to be shocked when human beings, who created the mythical divinities, peaceably accept morals which were then, as they are to-day, a part of our common humanity. The monarchs of Asia set us deplorable stand-

ards of ethics. To the Ptolemies it was a matter of duty to marry their own sisters. And when Augustus simply sent his litter to the door of the great Roman ladies whom he wished to honor with his favors, it was only the prelude to all the debaucheries of the decadence which it was his lot to inaugurate. What, then, is so surprising in the fact that man, creator of gods, created them only in his own image? Corneille in 'Polyeucte' flayed the adulteries of Olympus. We do not hear that Louis XIV scandalized him.

The myth was not a point of dogma. That is what we forget. The fantastic legends were probably less dangerous for a poetical people than our too outspoken modern novels are for us. Doubtless an imperious logic required that the unconscious creators of mythic personages, carried away by the affabulation of their divine narratives, should symbolize in myths every manifestation of human nature. They thought and acted as men of their times. And the same atavistic laws which allowed them so long to resist the teachings of experience obliged them through force of custom to present themselves such as they were shortly after the days of fig-leaves.

If I were not afraid of offending too many of my contemporaries, I should remind them of the degeneracy into which the Christian myth had the misfortune to fall. No one can overlook the fact that under the *ancien régime* unbelievable license was practiced in the convents. What would our virtuous Polyeucte have said of Alexander VI and of so many others? How ingenuous of Corneille's iconoclastic character to take as a basis for educational tales simple verbal fictions, representing the phenomena of the world! If he had only meditated in the company of Lucretius, Cicero, and Varro, he might not have been so extravagantly intolerant. Why did he not familiarize himself with current conditions by talking with his contemporaries? I say nothing of the Greek philosophers who guided all Roman thought, any of whose teachings would have set right his childish mistake. The men who deified Augustus gauged only too accurately the caliber of their gods.

The divine personages were set in motion by the living metaphor of the myth. Before being named, they were impersonal powers; together with a name, we endowed them with life — a personal life, fictitiously superior to our own. They made use of it. History is as much the outcome of the activities of man's divinities as of those of the human race.

Free from all dogmatism — for I repeat that to them myth was never an article of faith [1] — the Greek peoples, tribes, and families could through their bards unrestrainedly imagine, sing, and elaborate their fancies, and yet feel no twinge of conscience. Our present-day myths are derived from the same source and are of the same quality. They differ in that they have become dogmas and in such guise have tried to impose themselves on mankind through the brutalities of that 'divine charity,' for which, happily, our simple 'human pity' has been substituted.

Those celestial figures have existed for ages. And although the evolution of our emotional make-up has caused temples to give way to other temples, and those other temples to metaphysical structures — last refuge of divinities suffering analysis — our hereditary acceptance of loose thinking, aggravated by general debility of character, will for a long time yet maintain the custom of supplication of propitiatory prayers, and of the mystic offerings that, wholly unconnected with prosaic experience, go to make up the personal relations of primitive man with the monster he has made of the deified Unknown.

On the creation of myths [1] and of their exaggeratedly

[1] The word 'faith' itself had not the definite sense it has to-day. Aristophanes, who was a conservative, showed on the stage the gods under disgraceful conditions, and the petitions against Socrates and Anaxagoras were the result much more of the general tendency of their teaching than of any specific offense. The Greeks were still more or less consciously in the hesitating mood of India — a mood in spite of which man begins by adhering to some particular myth, but maintains the sentiment of universal tolerance from which Christians so regrettably departed.

[2] The word 'creation' is here truly appropriate, since the mythic personage, born of a slip in language, is made of no other substance than a name which sounded well in human ears. For that reason man, who is so quick to declare himself 'created,' justly merits the title of 'creator.'

romantic life there is too much to tell; encyclopædias would not suffice. The doctrinal structure of a mythology is what enables us to penetrate most deeply into original forms of thought. Whoever may care to consult Max Müller, A. Maury, Michel Bréal, Preller, Decharme, or Lang on the original forms that knowledge took when brought into contact with phenomena in the guise of personified powers, will soon find himself overwhelmed by swarms of unrestrainedly prolific absurdities, fit to thwart every effort at systematic research. If we consider only the evolution of the myth from those of Iran and India to those of the Christian sects, we shall be forced to recognize that the 'progress' of ages has not sensibly refined the art of creating fables.

Even if I were to limit myself to a few of the more notable examples, I could not here trace the course of the myths from their birth to their developed forms. In the sequence of the Indo-European religions of India, Persia, and Greece, we find such a profusion of myths, made up of such strange successions of adventures, as to disconcert us. The learned investigations of the German school have, by means of incomparable works on the formation and evolution of language, opened an abundant source of scientific explanation. Magnificent legions of investigators have helped in different ways and degrees to establish a science of articulate speech which gives us the surest basis for a science of thought. I pointed out some features of it when I discussed how the formation of words had unconsciously led first to the appearance, and then to the final creation, of gods.

Müller pays striking tribute to Locke, who bravely attacked the problem of words. It was he who started the revolution in knowledge whereby comparative philology so brilliantly clarified the evolution of the articulate word.[1]

[1] I should have liked to quote as a note a page or two of Max Müller, in order to show how that master applied to the problem of the myth the methods of philology. But I am forced to recognize that I should need the whole of one of his chapters to give a barely adequate idea of the matter. Hence I can merely refer the reader to his *Essay on Comparative Mythology*, or to the eleventh of

Although Müller, like Bunsen, remains entangled in the meshes of the primitive *a priori* that preceded observation of the Cosmos, the two scholars blazed such clear trails through the history of human understanding that a marvelous body of coördinated scientific fact was at once definitely established. One may say that at every moment the ploughshares of research uncover for us new relics of a past into which the roots of our thinking life are sunk. Man discloses himself when he mentally constructs those phrases which give objective form to aspects of the universe with which the activities of his own Ego are fused.

Since at the beginning we could grasp neither the elements of things nor the whole, we had to be content with hasty inferences about the world and about ourselves, without which we should not have been able to guide our first investigations into the primitive life which our ancestors, like the Neanderthal man and the man of Chapelle-aux-Saints, had started. At first the synthesis of divinity presented itself to our ignorance, and we jumped at it and we have clung to it so firmly that our piecemeal acquisitions of science have had to adapt themselves to it and to uphold, at least in phraseology, theological conclusions the premises of which were crumbling under our feet.

In that respect the attitude of mind of Müller and of Bunsen is most significant. Incomparably trained in scientific observation, Müller is as truly the founder of comparative mythology as of comparative philology, which at bottom are but one and the same science. Carried away by the ardor of his research, he is ready to accept any conclusion to which his analysis may lead, even if in emergencies he is obliged once in a while to make it agree with an *a priori* synthesis of divinity, which he does not wish to give up. No one can doubt his perfect good faith. But he clings more obstinately to the inferences of his philology, than to the popular formulæ of *sub*-thinkers — as we may

his *New Lessons on the Origin of Language*, which is especially devoted to the study of the myth of Aurora. The reader will not fail to admire the learned ingenuity of the effort and the happy marshaling of the results.

term those people expert in the art of reconciling contraries. At appropriate moments he pauses to set up a milestone in honor of Divinity, as Thumbling dropped his pebbles to mark the path he had traveled. It was a salve to his conscience as well as a sop to his readers.

Bunsen, who is a generalizer and philosopher as well as a man of science, proceeds quite differently. Less steeped than Müller in philology, he is his superior in the way he shows the relation and the development of myths throughout the ages and among the various historic peoples. His ambition is to find consciousness of God in all the religions of the earth.[1] What, precisely, is consciousness of God? Do away with its vagueness, and the formula fails. Bunsen is a scholar, a religiously minded man, who finds and refinds his God in everything since it was he who put him there originally. He does not wait to reach Socrates before discovering unity in the confusion of the Hellenic myths. I, too, find myself wondering whether that strange fiction of India which at one time regarded as the superior deity the one that every hymn was proud to invoke did not transmit as far as Greece some elements of that universal reconciliation of all competing divinities in a synthesis of more or less accurately defined forces. The remote transition of the polytheistic pantheism of India to the proliferation of the Greek gods under the rule of Zeus too often leaves the points of connection obscure; and the kinship of the divine names as revealed by philology does not always imply that identity of conception underlies their perpetual variations.

What Bunsen calls 'consciousness of God' in cults that are mutually exclusive is at bottom the original idealism which has successively personified all the energies of the world, whether distinguished from one another by analysis or fused with one another by synthesis, with an eye to a manipulation by the cultural magic that is fostered by the absence of all criticism. Hence, one can easily understand how Bunsen found signs of an original idealism even in those

[1] Bunsen: *God in History.*

arid deserts of Roman religion which ended in the base worship of the Emperors.

If I emphasize Bunsen's views, it is because I do not regard them as so foreign to experimental philosophy as might be supposed. Doubtless we shall always disagree on the primitive idea of world-forces as personalities — an idea which led our ancestors to wander sadly from the true path of scientific research. But pantheism has so thoroughly united *being* and *not being*, the 'I am HE who is' of Jahveh, and the 'I am THAT which is' of the Cosmos, that possibly our rudimentary Biblical God will become attenuated by insensible degradations and finally vanish. Theology cannot come to an end, as did the Goddess of Reason, with theatrical suddenness. It will die from progressive anæmia, induced by the laborious advance of age-long experiment. An inconceivable absolute will collapse under the repeated blows of relative knowledge.

We can talk, but not conceive, of an infinite universe, for we have only our relativity wherewith to measure it. Of that universe we are a transient element, whose function it is to reflect certain fleeting aspects of things, other aspects of which escape us. We rise in the evolutionary scale as much through climbing the laborious steps of knowledge as through appreciating the limits of our comprehension of the unknown.

And, since our need to know is what torments us principally, and since our scientific knowledge is daily growing, we find it hard to resign ourselves to the relativities within which our organism confines us. The chasm between the absolute and the relative tempts us, torments us; we long to bridge it. It is the *raison d'être* of that ideal upon which, looking beyond the conquests of scientific knowledge, we glue our eyes. Like every part of us, the ideal develops from the crude, savage fetish to the extravagances of the *élan vital*, which is Bergson's pet name for universal energy. No matter how far down in the scale a man may be, he has an ideal made to the measure of his spiritual stature. And no intellect is so advanced that it does not aspire to further

progress. The ideal, furthermore, has this beautiful quality: unconscious of any dependence upon the Cosmos, it stimulates every man according to his temperament and offers him manifold pleasures which vague realities deny.

To speak my mind, I believe that it is rather the consciousness of what man lacks than the sense of what he has that puts him above the creeping animal. We are not truly complete without the sense of imperfection that the incompleteness of our knowledge brings us. The distance between animal knowledge and human knowledge is merely a matter of degree. The aspiration toward something beyond himself is what makes thinking man superior to all other living creatures. When Bunsen with his powerful intellect atavistically refuses to hope for something beyond an anthropomorphic deity, he hurts only himself. He clips the wings of his imagination just as it is ready to fly, because he persists in considering man as a being who can hope for more than the facts of the universe promise.

Is, then, the absolute, which is not ours to know, anything but a simple recognition of the fact that we exist, and can we not reconcile ourselves to an endless universe when we find that the idea of limits is a mere trick of our sensations? Is it not that blending of dreams with thoughts which in every human activity calls up a latent power in the search for what may be the inaccessible? Knowledge of the relations of things permits us to direct some of them toward predetermined ends. Thus, acting on the Cosmos as well as on ourselves, we gain a constantly growing control over natural forces. What could do more to encourage us to persevere than to find that we accomplish results? What excuse is there, then, for that Oriental renunciation with which Asia has too long faced life?

If man is about to lose his god forever, it is high time for him to find himself and, once he has done so, to attempt a life in advance of that forced on him by the original terms of his heredity. Perhaps we are better than the puerility of our common character has made us believe. Idealism, freed of its myths, challenges us to test our strength. We no

longer need to personify the forces of the world in order to investigate them and to adapt ourselves to them. The great battles between the Titans and the Olympians ended in the total defeat of the superhuman forces.

Ancient and modern myths are only meaningless pictures which are fading out. Zeus, Hera, Demeter, Heracles, Hephæstos, Apollo, Artemis, Aurora, Pandora, Prometheus, and all the rest, now that their hour has struck, have no other value than that of episodes in the history of the human mind. During one period of our mental progress we vitalized them. From that moment the same abyss that lies in wait for us awaited them around the next corner. Sooner or later the celestial personalities will be no more than a memory of fairyland. Face to face with the universe, man will be the sole evidence of his audacious dreams of divinity, since the god he vainly sought is himself.

Already we have come to recognize that mythology was among the first forms of the linguistic manifestation of human knowledge. Müller, in his translation of Hesiod, threw noteworthy light on the subject when he remarked that the archaic formula, 'Selene bent over the sleeping Endymion, kissing him,' should be translated into modern language by the simple words: 'It was night.' No passage better explains the history of the successive phenomena of the mind testing its powers in attempts to interpret a world that simultaneously offers itself and draws back. The first flights of imagination brought us nothing but metaphors expanded into fables, and, as soon as we came to grips with superhuman personalities of varied characteristics, the animating principle of our evolution established itself in a poetic dream of apotheosis, which took the place of the organic activities of an objectively determined thinking life. Man, oppressed by his domineering gods, developed a prodigious epic movement which, whether or not successful, purposed nothing less than the conquest of eternity. From the very start the intervention of the myth changed the whole purport of human life. It crushed with deadly weight our need, our will, to know, our freedom to fulfill our task of

ascertaining and establishing the truth. And even yet we are by no means free from the load.

I have considered only that poetic age in which the myth appeared — the age when in spite of the terror of its lightnings the irresistible seduction of its youthful beauty possessed man's being. Let us courageously consider it as it presented itself — with its vision of superhuman aid, which at first fascinated us as a dream untrammeled by facts. Later on, the man who sought practical realization found himself obliged to know — that is, to rely no longer on shapes of suggestive fancy, but on scientific facts — if he were to live according to tested and proved conclusions instead of in the halls of dreams and of illusory joys and sorrows.

Apollo, one of the numberless solar gods, had his day at Delphi and at Delos.[1] However, after having vainly questioned the Pythian oracle, man was forced to have recourse to the prosaic spectrum analysis of light, and the information thus derived, unlike that derived from the myth, was based on fact. Of what importance was the defeat of Julian, if the problem, stated in new terms, remained whether to surrender before the inconceivable or to accept the bitter struggle between man and the Cosmos, and thus to achieve a knowledge on which an understanding of things could be based? No mere appearance of a mythic divinity, nor the

[1] The number of laudatory epithets lavished on personified phenomena was bound to induce a spawning of divinities, that is, the creation of a new god for every aspect under which the original god was worshiped. 'The Sun,' says Michel Bréal, 'is in turn the "brilliant one" (Dyaus), the "friendly one" (Mithras), the "generous one," the "beneficent one," the "nourishing one," the Creator, the Master of Heaven, etc.' The multiple epithets called to life as many divine mythically related personages. How many gods were thus born, how many disappeared before they had time even to leave us the ephemeral vanity of a vanished name!

It is appropriate here to remark that among the peoples of the warm countries, who shut themselves up by day and led forth their flocks by night, the cult of the friendly moon preceded that of the sun. Such, for example, was apparently the case with the Babylonians. Only toward the middle of the last century was the sun recognized as the source of all life. They had worshiped the sun because he veiled himself in dazzling light. They worshiped the moon because she unveiled herself. Man must worship at any cost.

narrative of its adventures, can enlighten us on the relative values of the subjective and of the objective, which we find so hard to understand. The sequence leading from the most barbarous to the most refined myth attests nothing except a search for light in which from the very start we looked the wrong way.

The successful investigations of our scholars have begun to disencumber the clogged approaches to mythology. Since myths escaped critical examination, they were superlatively endowed with a power that tempted believers to misuse them. The gentlest, like Christ himself, were incredibly persecuted.[1] For the individual history of the great myths I refer the reader to the scholars who have specialized in them. I do not imply that the biography of each mythic personage is not a marvelous subject for comment, above all at the period of the cosmogonies, but personally I should not emerge alive from such a jungle. All mythology consists of juxtaposed fables that have unceasingly reacted on one another as the migrations, or even the change of residence, of the creative bards happened to determine.

The very nature of myths prevented their inspiring any doctrine. The bard needed only his own imagination to relate them, and once related, they took rank as living things among the other delusions about the unknown. What tempted the genius of one bard repelled the genius of another, so that every diversity of poetic interpretation ensued. And the arbiter among the different versions had necessarily to be the fluctuating and ignorant crowd, swayed by the obscure moods of the moment. Crowds are alike, and so the adventures of mythic personages constantly overlapped one another and mingled. Realms of religious emotion from which emanated special myths came into being according to the fortune of this or that name, which

[1] The noble victim of Golgotha, like Buddha himself, falls rather into the category of the deified heroes of Euhemerus. However, ever since the first attempts at coördination, the swarming myths have seized on the Crucified. Sacré-Cœur and Lourdes are conspicuous enough testimony of the fact. At least they have not thus far caused any blood to flow.

came to be regarded as a phenomenon. Who would even dare try to count the solar myths?

As it is a question of linguistics, learned men have spent their lives in opening paths into this confused mass of legends and personages, always and everywhere confused. Michel Bréal on the solar myth of Heracles and Cacus, and Decharme at the very beginning of his discussion of the myths of Greece, show, however, that really scientific trails can be followed among all the mixed-up paths. But if that is true of Greece, what about India? Where are the means of comparing, connecting, and systematizing its religious beliefs with an eye to a synthesis of the workings of the human mind, when it is necessary to go back to the earliest sources of human thought if the mysterious trace of the kinship of all the gods of all the different periods is to be found? Whatever may happen, broad avenues of enlightenment have already been started.

We must push back to those remotest limits of far-away origins, when the low-grade consciousness of primitive minds more easily conceive invisible powers acting on the world than objective relationships requiring thousands of years even for imperfect elucidation. What a mass of monographs it takes to reconstruct from the débris of language Assyrian, Chaldean, Hindu, Persian, Egyptian, Greek, and even Roman myths — to cite only the better known — and to establish and interpret all the excrescences caused by their reciprocal encroachments! What classifications must be sought, what explanations pursued! How many legends, like and unlike, are found to have merged and crossed, or to have lost their identities! What a battle of hypotheses! What inductions must be made from the moving pictures of fables! How many inferences may be drawn from metaphysical flights that by the wizardry of words have given every kind of personality to simple names! All that, however, is merely the sign of the primal reactions of human sensibility, the deep-hidden thread of which enables us to realize the original tendencies of man's mingled knowledge and misconception.

Behold them pass, gorgeously attended — these superhuman personages, majestic symbols of the arrogant inadequacy of man obsessed by the activities of the universe and by the theatrical interpretations thereof to which our childish ignorance clung! They mark the beginning of our imaginative 'comprehension,' the evolution of which ultimately led us to adopt corroborated experiment. They form the grand assembly of all the gods, fallen or still exalted, who have reacted, and who still react, so powerfully on man, their creator, on the stage of the universe. Dead or alive, they were endowed with every attribute of life except organic existence, which is reality. Such as they are, they are the mirror in which man with half-shut eyes saw himself pass, for he spontaneously expressed himself in the gods whom he had called into being. To understand himself, he had first of all to judge the truly creative work in which he has revealed himself. In his cruel or beneficent divinities he has marked the stages of his evolution. It behooves us, going back over the trail of ages, to discover the successive qualities, corresponding to our own, which in our gods reveal the progress of humanity, to be able to infer the actual man from the god he had invented.

From known systems of relationships other series logically follow. For we are never more than a fleeting moment, and since each of our moments governs the one that follows it, we have to judge them as a whole and by their effects. Thus the relative truths we reach become of the utmost importance in fulfilling our destinies. Our mythic personalities may have charmed the way, but they confused it. In them we created forms of non-existence to which our imagination imparted the breath of life. Accordingly, the day on which observation could produce its testimony, the case was decided. And you, O myths, whatever may have been your history, now covered with blood, now radiating a flawless beauty, express phases of the ideal that assures you, whether pagan or Christian, a place of honor in the history of thought. You have known in turn greatness and failure; but you still work the shining furrow in which the highest as-

pirations of man have germinated. Now that to us Isis is but a veil forever rent, we are glad and grateful to keep that truth in mind. Let us pay a last homage to the twilight of mystery. The hour of knowledge has struck.

THE EVOLUTION OF THE GODS

From the day when the fiction of a divine world won universal assent, imagination was bound to give itself free course in the open field of uncontrolled poetry. But even before observation had in the most timid way asked for its rights, spontaneously came restlessness and doubt — pride of the human intellect — and then began the great and endless battle of ideas. India's glory is that from the beginning it boldly tempered its spontaneous deifications with doubt. To us, thanks to the experimental method, the future seems a limitless field of work across which knowledge will resolutely make its way toward a closer approximation to an understanding of relationships — toward that blank wall of the absolute. There are imaginary 'truths' and scientific 'truths' still echoing atavistic emotion, from which we cannot tear loose by a simple effort of reasoning. In old days conversions came as suddenly as thunder-claps.

I see, I know, I do believe, I am set right.[1]

To-day we are obliged to learn slowly under the strain of painful labor. And the most poignant element of the drama will continue to be the shock of contending forces in the bold effort of our human thought to penetrate into the deep secrets of a planetary world which the least accident in stoking the solar furnaces may suddenly annihilate.

It was late before the symbolic Athene — wisdom and knowledge combined — could spring fully armed from the head of Zeus. Untold ages ago our first gods took control of the activities of the primitive dreams in which knowledge went astray. With their cult of propitiation the most seductive divinities could have no more than the momentary value of an improvisation subject to verification through

[1] Je vois, je sais, je crois, je suis désabusée. (Corneille, *Polyeucte.*)

future experience. In this case, however, other questions were involved than merely that of explaining the universe for the advancement of knowledge and its utilitarian consequences. 'Fear made the first gods.' So be it. But what kind of aspiration, what emotional dynamics, worked with it? Under the same names, the same divinities — offspring of the same human emotions — will be found to differ, thus showing that the religious activities in widely separated places had corresponding aspects. The Herakles of Tirynthus and the Hera of Samos had their variations like the 'Our Ladies' of to-day. Our diverse needs in the matter of gods became so precise that even to-day we like to feel ourselves on terms of especial intimacy with some personage of the sacred legends who acts as our advocate near the divinity. Born of man, the gods adapted themselves to their human creator because of the necessity of a common understanding. Just as the activities of the intelligence developed, so the divinities, moulded by us out of our thoughts and sentiments, were obliged, since they could be only enlargements of ourselves, to keep step with our development. Because we were evolving, they had to evolve. Tell me what god you have, and I will tell you what you are, or, rather, what you say you are, what you believe you are, though you may lack the power to make yourself so. The god that we brought into being to guide us follows us like our shadow that cannot detach itself from us, and that is obliged from age to age to conform to the development of our perpetually changing individual reactions.

The evolution of our gods, then, synchronized with our own. No argument is necessary to account for the cruelty of the primitive gods, which simply reflects the mentality which gave them birth, or for the fact that the records of divine mentality are the records of human evolution. In fact, each believer's idea of his god accords directly with his own mental and emotional development. Indeed, there are actually as many adaptations of divinity and as many different gods as there are worshipers.

I do not dare to say that the resulting forms of thought

and feeling are anything to be proud of, since on analysis we can find only the evolution of human sensibility in various forms of a pitiable servitude under an irresistible omnipotence. From the floor of the cave at Delos, grooved to catch the blood of sacrificial victims, to the fagots around the stakes which were the expressions of the noble charity derived from Christ is the progress so great? The fact is that the gods, though described as immutable, indicate only the transient stages of human evolution, while we, alternately conscious and unconscious of ourselves, are more prone to express our provisional convictions by formulæ than by our lives. And moreover there is much more besides the blood of Delos and the fagots piled round the stake. There is Buddha, there is Socrates, there are Jesus and his follower, Francis of Assisi. The pendulum swings from the very madness of evil to the finest self-sacrifice. And its range, which we seek to know, is hard to measure.

THE NATURE OF THE OBSTACLES

It is a question how long ago we might have been freed from our primitive terrors, had not our highest gifts of analysis and of synthesis constantly encountered the obstinate resistance of obscure emotions inherited from ancestors not yet capable of disciplined observation. The fact is that, opposed to the first impulse toward scientific knowledge, was the atavistic power of primal emotions, which profoundly agitated our fathers, and which will continue to agitate us and our children. And those emotions are well-nigh irresistible when powerful dogmatic organizations formulate and impose them! To justify any lamentation on our part, we should begin by understanding ourselves. And, if we understood ourselves, most of our causes for complaint would be eliminated.

Our investigations into the world daily become not only more extensive, but more profound. From that circumstance has resulted a perpetual sequence of varying activities logically derived from our successive acquisitions of

knowledge. Are we justified in asserting that our remarkable mental progress has resulted in a corresponding moral progress? Even though the question may seem a delicate one, we must consider it.

It is generally accepted that the emotion, the thought, and the action of to-day are the direct and natural sequel of the emotion, the thought, and the action of yesterday, the special character of which is determined by the latest of cumulative impulses. Thus decree the subconscious hereditary activities into which the primary impulses of our life are easily lured by the disastrous comfort of taking the path of least resistance. That we take it is due to mental indolence and to the difficulty of breaking the old instinctive adjustments which are familiar to us, in order to experiment with laborious realizations of ideas which upset the order of our fundamental habits. Add the suspicion of intellectual audacities necessarily shocking to the sluggish crowd whose passive ignorance leads it to yield to the authority of established powers. In spite of our curiosity, everything conspires with an instinctive fear of troubling the atavistic peace of ignorance to keep us torpid in the primitive stupor of the unknown.

Popular opinion long believed that general education would perfect man almost instantaneously, just as in the old days men were dramatically perfected through sudden religious conversion.[1] The result has not met expectations. There are many reasons. To begin with, the kind of instruction dealt out to our young people is, in spite of notable progress, too *a priori* in character to enable any one to expect from it in a short interval any actual progress toward positive knowledge. It is no longer enough to say, 'I be-

[1] In France 'general education' consists chiefly in a law of obligatory education that has never been enforced. Mere verbal reform is generally enough for us. In matters of higher education we have to some extent preserved the elements of eminence. However, when I asked M. Boule whether he could not find among his students some one to study the anatomical and physiological mechanism of human erectness, he answered sadly, 'We have no more students. Every one wants to make money.' I am not sure that the undergraduate body of the church schools has changed materially.

lieve.' The problem is to assimilate experimental knowledge and courageously to draw from it personal conclusions on which to base the activities of a newly oriented life. Such an undertaking is inevitably slow in bringing returns. Time, much time, is needed to form minds free from the rigidity of generally accepted ideas, and, above all, time is needed to change the reflexes that are the armature of life.

Until now our principal effort has been to unite, to 'reconcile,' two contradictory kinds of education; one, *a priori* in character, offered as a universal foundation for the capital decisions of life, the other, a store of accumulated scientific facts from which, however, all scientific conclusions have been banished lest they clash with the teachings of ancestral dogmatism, to which, through many interests of a social kind, the family remains attached.

What happens? The most obvious result is the inculcation of a two-faced life, the general convenience of which the child grasps too quickly to be tempted to depart from it. Is it not the family that through its implicit control of the entire emotional life has made the home? Can we, then, expect the family, and especially the feminine influence in the family — an influence profoundly conservative — to take the initiative in making bold changes? There will always be reasons enough to account for the too facile weakening of character and ample justification for adapting it to those permanent interests by which the social world is dominated.

Furthermore, can we expect that every one is going to take the trouble to make up a strict balance-sheet of his own individual thought, and then face all the consequences? It is so easy merely to live, when, from the opposite poles of human life, imagination and immediate advantage, every influence, together with the seduction of the easiest way, coöperate in favor of a 'peaceful' acceptance of the *status quo* amid the incessant disappointments of life.

'Leave us our hopes,' groans a suffering people. 'If your new truth necessarily seems harsh to us, do not hinder us from tempering it to our weak souls. What does it matter that we cherish the delusion of a different de-

stiny, if that delusion is the very source from which we derive the strength to endure our present life? In the interest of good order in this world, we are willing to resign ourselves to the threat of tortures in the other world, for it is "most advisable" that the wicked should believe in them, though, generally speaking, they are the least inclined to do so. As for eternal bliss, we embrace the idea most enthusiastically. It would be so sweet to us to find in some other sphere the joys of earth without its ills, and if there are everlasting woes, we are willing to trust divine benevolence to attenuate them. What we ask is to hope for entire or partial indemnification for our suffering. Is it nothing that even now, on the hither side of death, we can enjoy the anticipation of happiness? We prefer to keep the phantoms of our night rather than be blinded by your sun!'

How argue with people who will not argue? Humanity is made up of the strong and of the weak. If life on earth is as wretched as it is represented to us to be, it is a fearful indictment of this God, the Creator, from whom it pleases us to hope for a doubtful reparation of the evil that he himself has caused! On the other hand, if it is man's lot to think and to seek to know, while his pathological weakness condemns him to be content with childish dreams which have hardly outgrown their original crudity, each one of us must accept the risks involved in following out his fate with such courage as nature has chanced to provide him. Rising above the inevitable failures, there will be men of will, of powerful character, who in a flash of enlightenment will master the inexorable unconsciousness of the universe. And only they who have accepted the unremitting struggle toward an ideal human destiny shall live in noble hope.

Curiously enough, it still happens that the irreducible antinomy of the two opposed influences which we have been discussing is often found in a single mind, sometimes of the highest order. It is only necessary to cite the names of Pasteur and of Claude Bernard. 'When I leave my laboratory,' one of them is supposed to have said, 'I go into my oratory.' No one disputes the genius of Newton. It is never-

theless true that during the last ten years of his life that incomparable scientist was perplexed by the most afflicting mysticism. The excessive efforts of outstanding intellects will always be more or less contradictory. In spite of the individual atavistic urge which such men reveal, the general run of the best minds will always refuse to investigate the world by two mutually exclusive methods.

That circumstance does not preclude a universally known experimental proof from long remaining as if annulled in those superior minds which the power of atavism holds solidly bolted into the iron collars of the old jails. The Church appeared victorious at the trial of Galileo. Naïf victim of its own propaganda, the Inquisition grimly persisted in preventing the earth from revolving, for it seemed to it that, were scientific research to triumph, the authority of the 'Holy Scriptures' would be irremediably destroyed. Poor priests, blind to the point of believing that *faith* could depend on a fact, or on logical reasoning! Does not the Bible itself, in Genesis, tell us that the sun appeared three days after the coming of light?[1] Who cares? Finally, the Church granted to an obstinate earth permission to fulfill the law of its nature, and every faithful believer hastily made the best he could of the situation. For in such matters the faithful rarely bother about proof. Have they not been taught that the fewer the proofs, the greater the merit of their faith? Galileo might be right, but the Church could never be wrong.

When, through the folly of a simpleton, the genie of the Arabian tale had escaped from his bottle, the imprudent fellow vainly tried to make him go back again. Creating gods is only too common. I have seen them made in India by the hundreds.[2] It is a quite different matter to control them and to make them enter into a system of future cul-

[1] In the Mosaic Genesis, God creates light the first day, and the sun the fourth day, thus separating light from darkness. The inconsistency is simply the effect of differing texts. The same remark holds true for the creation of man and of woman on two separate occasions, but with quite different results.

[2] A stain of red paint on a rock or a stone, and behold! — a divinity with whom to consult.

ture. What does it matter if every one arrogates to himself the privilege of adapting himself to them?

And, whether it is a question of all the gods that ever were or of the unique Creator into whom Moses and Mahomet ultimately combined them, the philosophy of this chronicle of man is in no way affected. Very proud of having centralized the Powers of Heaven after the example of earthly administrations, our ingenuous Christians, having received ready-made the God of Moses — once the exclusive property of the Jewish people — did not know how to rid themselves of the Hindu Trinity with its divine cohorts.

Without either painted or carved figures — for to the minds of the great lawgivers of Asia an image was too gross a degradation of the invisible — synagogues and mosques have remained wholly consecrated to the One God,[1] whereas our churches are cluttered with images of a fetishism which has so far deteriorated as to establish a cult of a Sacred Heart, supposed to fulfill in the god the functions that the language of the period, which preceded the discoveries of biology, attributed to the heart in man. Not to lag behind, our flock of lay sheep hastens to assign, as the Pantheon in Paris attests, a cult to the 'heart' of our great men — in spite of the elementary science which has definitely proved that the organ plays no part in the manifestations either of sentiment or of will.

Renan, the grand priest of the lay world, believed that monotheism spontaneously satisfied the needs of nomadic populations. 'The desert is monotheistic,' said he, forgetting that even in the desert there is always the vault of heaven with its stars to gaze at. Thus, the religion of the Jews, according to him, must have begun in monotheism, 'product of a race that had few religious needs.' In the de-

[1] The Aryan religion of Zoroaster also dispensed with images, as Christianity was on the point of doing, with Leo the Isaurian. Persia was too near the great fatherland of the Semites (which finally absorbed it) not to undergo its influence. Its originality consisted above all in so aggrandizing Ahriman (the god of evil) as to reach the outskirts of a dualistic faith. Buddhism originally proscribed the images which were later forced upon it through a return of popular fetishism inspired by the Hellenistic sculptures of Gandhara.

sert, as everywhere else, man needs fire. There is no reason why the Semites should have escaped the common fate of worshiping the hearth-fire as well as the sun, which, in the desert of all places, could not be overlooked. When Moses was called to Mount Sinai, 'the form of the glory of the Lord' was on the summit of the mountain 'like a devouring fire' before the eyes of the children of Israel. The fire on the altar, the holocausts and the seven-branched candlestick of the tabernacle — are they not obvious enough survivals of the primitive cult?

'Thou shalt not make unto thee any graven images,' we read in Exodus. That commandment of Jahveh's indicates that other gods had preceded him. From this vague and shapeless Jahveh doubtless came Israel's horror, to all appearance tardy, of all anthropomorphic representations of the deity. Does not the prohibition of the worship of idols of clay or of brass, including the famous golden calf set up while Moses was absent occupied in receiving the Tables of the Law,[1] show the people giving themselves up to idolatry under the leadership of Aaron? Every one knows that Jahveh felt obliged to drown that impious revolt in blood. Do we not yet see Rachel 'steal her father's idols' and hear Laban ask her: 'Why have you taken away my gods?' The history of the Jews shows them ever on the verge either of returning to their primitive worship or of letting themselves be lured to the religion of the foreigner. The Baal of Athalie bears witness to the fact. Joshua expressly reproached the Hebrews for wanting to remain faithful to the gods that their fathers adored beyond the Euphrates. What could be farther removed from instinctive monotheism?

Müller, who stoutly opposed this thesis of Renan's, argues that polytheism was preceded by a primitive and universal deism. Nothing could be more contrary to established fact. In the stone, in the tree, in the bush, everywhere we meet the individual gods of primitive man. With-

[1] We wonder why the precepts intended for man's use were not given to him until so long after the creation. Is it surprising that the creature began by falling?

out pausing to consider the difficulties confronting the learned mythologist, who obstinately wished to install his Biblical God in the profoundest depths of the human heart, we can clearly see that the primitive deism which puts a god into a stone or into the sun had rather put another god into another stone — or into the moon — than philosophically to group all the forces of a world system under the rule of a supreme inspirer of all the differentiated energies. In reality, a long period of incubation was needed before even 'Jahveh' became the ultimate god of the Jews. And the bloody struggles that followed had as an object less to increase his domain than to preserve his worship. To 'Allah,' successor of the idolatries of the Arab tribes, fell the rôle of being the most powerful upholder of Semitic faith, for Jahveh had need of the Aryan variants of the Golgothian heresy in order to win the 'Gentiles.' The evolution of the gods went on.

As a result of the multiplicity of personages demanding worship, our Roman Christianity has come to distinguish two cults: total adoration, called *latria*, and the veneration with which our lesser divinities have to be content, or *dulia*. More acts of *dulia* than of *latria* are performed at the polytheistic altars of our temples, where the Son and the Mother, with their attendant train of apostles and saints, have little by little eliminated the Father Everlasting, images of whom have become rare. The same thing happened in the land of the Vedas, where Brahma, the ancient creator, who now has but one temple, has been superseded in public favor by Siva and Vishnu, who emanated from him. At Saint Peter's in Rome you may see an anonymous bronze statue, labeled with the name of the Apostle Peter, the great toe of which is worn by the kisses of the faithful. What god ever received more fervent homage?

Better still, the rear-guard of the Christian cult, the Sacré-Cœur, Lourdes, la Salette, and all the other fashionable miracles, have come to the rescue of hard-pressed verbal monotheism. To whom does every devotee, seeking a personal service, address himself? Such and such a saint

recovers lost articles. Such and such another saint specializes in curing the diseases of cattle. The good Saint Corneille vaingloriously displays in a Brittany church, where I have read them, the imploring or grateful letters that are addressed to him. The replies are lacking. The devotee of his own accord makes up for the modesty of the god. And if the supplication seems to remain unanswered, the suppliant can still enjoy the pleasure of having hoped.

'If,' to paraphrase a couplet of La Fontaine's, 'I heard Peau d'Ane recited I listened with the keenest pleasure.' [1] La Fontaine knew very well that men pass the better part of their lives in telling one another the story of Peau d'Ane and that when they have finished the tale they at once begin all over again. Is not that precisely what we do when on our own authority we introduce miracles into nature in order to amaze ourselves, as if nature itself were not a sufficient miracle?

Dreams, birds of the infinite spaces, have full freedom. To maintain and to confine the impetuosity of thought within the bounds wherein the inflexible laws of our relativity restrict it, is a heavy and a thankless task. Do we need further explanations why men of every degree of intelligence are generally ready to follow the flights of reverie, or why the difficulties of scientific research throw us back on the popular desire for immediate revelation, free from all the pains of fruitless effort? Thus, it is only too easy to understand why the indolence of the Oriental grasps eagerly at the intoxicating epics of his theology, and would do so even without the help of poppy and of hemp, whereas our empiricism is content to cut down to its own measure the phantoms of Asia.

What better conveyance could we ask than dreams unhampered by the troublesome balance-wheel of thought to carry us across the abyss between birth and death? Ours be those magic drugs that allow us to attain that happy life, which we vainly ask of an indifferent Cosmos! Whether it

[1] *Si Peau d'Ane m'était conté*
J'y prendrais un plaisir extrême.

be poison or not, is not that the cup which we are offered when we are asked to reject the actual facts of knowledge on the ground that they do not afford us the wished-for satisfactions? Whether those satisfactions come from narcotic addiction or from religious pomps, what does it matter, provided our emotions are stirred? The dreamer asks his dream to carry him as far as possible from the modest planetary horizon which hems him in. The artificial development of man's emotions, which lead him ingenuously to rise in ever-recurring revolt against the decrees of the Cosmos, is nothing but a trick played upon us by our desire to take the easiest way; that is, they are victories of cowardice.

CHAPTER IV

GODS AND LAWS

THE REMOTE ANCESTRAL NIGHT

WE have seen the gods, like the warriors sprung from dragons' teeth, leap completely armed from the primal shudder of human sensation, which, thanks to the gestation of thought, soon received concrete expression. We have no means of seeking out the elements of that primitive story, other than prudent inductions based on what has been saved from the wreck of those times. Those chapters in the history of man which would help us most in the historic reconstruction of man and of his gods (who are of the same blood as he) are the hardest to come at. What a flood of light would be shed on the man of our day and on his theologies if we could find some records made by our obscure ancestors, and observe, as it occurred, the first emergence of their divinities, leaping from their lips on winged words!

All that is night, the impenetrable night of our remote ancestors. Man was still too near the animal to rise to the point of observing himself and the world, or even of transmitting to us the least trace of his vague sensations. Incalculable ages were to roll by before the idea occurred to man to record his thoughts. Ever since, knowledge has battled with ignorance to save that record from oblivion or error.

As we retrace the course of the ages, we find signs of men on the crust of the globe. Their vestiges, their monuments, still speak, but they cannot tell us what our craving for knowledge demands. What have become of the echoes of the indescribable emotions that were the manifestations of life in the infancy of intelligence? Although the planet trembled thereat, it will not betray the secret.

Even so, the pictures scratched or painted on the walls of the caves of Dordogne and of the Pyrenees present definite problems. The images of animals, the art of

which is astonishingly realistic, cannot be merely æsthetic in aim. We are more inclined to interpret them as representing fetishes, which formed parts of myths of which we know nothing to-day. Certain dances, performed by sketchily drawn female figures, suggest the idea of an ithyphallic rite such as we find in many other places. As soon as there is a god, a myth springs up to describe his imperiously active domination.

Besides those unbelievable achievements of a stone chisel, of a hatchet, or of a brush, we also find freely drawn figures that seem to be preliminary sketches and also rude silhouettes of anthropomorphic goddesses,[1] from which it is clear that the feminine figure had not then reached the perfection of its charm.

Furthermore, those primitive images contain elements of contrast. Many of them seem to indicate a particular regard for the primitive companions of the savage, sometimes domesticated, perhaps already promoted to the rank of divinities. Would it be so extraordinary if the men of that time, like the men of to-day, should have brought together sacred images in close retreats unfit for habitation — much like our chapels?

The boldness of the artists' interpretations indicates a primitive serenity of mind rather than that terror which, we are told, was the origin of the first gods. The animality of our first ancestors preserved them at the start from the shocks of astonishment that later revealed to them the world as a succession of dramatic climaxes, which laid the foundations of philosophy. Much time was required to reach that point.

SKY, SUN, AND FIRE

All comments on the primitive divinities must be wholly hypothetical. Fustel de Coulanges in his 'Cité Antique' tells us that the hearth-fire was the birthplace of the first religions. All the mythologists, however, agree in re-

[1] There is nothing that better characterizes the anthropomorphic origin of the gods than the useless demarcation of sex.

cognizing the common nature of the myths of the sun and of fire. Since the discovery of earthly fire necessarily came later than that of the sun, the heavenly fires must surely have attracted and held the attention of our ancestors before they felt wonder and gratitude at burning twigs.

In that sense it was from the heavens that in times unknown the first gleam of thought burst on man.[1] It constituted the first move of the intelligence toward interpretations of phenomena that were to make our most remote ancestors progressively pass from the mental state of the animal to the nascent intellectuality of erect man (*homo erectus*), and that were ultimately to lift him to the rank of thinking man (*homo sapiens*). At whatever moment the institution of the hearth may be supposed to have appeared, it was necessarily preceded by a period in which the preservation of the child was, as among animals, the principal interest of the either casually or permanently united parents. The present life of our inferior congeners offers us ample and living testimony that in ages unknown to us a purely animal impulse had set up primitive families around the newborn child. The human family, no doubt, existed before the discovery of fire, which consolidated it, but which did not create it any more than it did among the animals which lacked a home, or which used only the temporary home of the den or of the nest, and whose families we actually see develop before our eyes.

At some indefinitely remote period the sky and the stars came to be regarded as supreme. The sun — which is the motive energy of the mechanism of the world, the dazzling giver of all active life, the profound source of the permanent family group whereby man rose from savagery to the first pleasures of nascent civilization — had only to appear for the majesty of his dominion to evoke the spontaneous burst of admiration that was to become a rite of gratitude or of supplication.

'For centuries,' declaims the Prometheus of Æschylus,

[1] In our modern language the word 'Heaven' is still currently used as a name for the Supreme Divinity.

'men lived like the phantoms of dreams.' The fire of heaven, gift of the Titan in revolt, really created a new humanity in times of which Lucretius, long after the great dramatist, has left us a vivid picture. Fire was a bewildering marvel, and the emotion which it awakened has never been dispelled. How shall we comment on the passage wherein the Lucretian god (who had read the great philosophers of Greece) announced, anticipating the course of later thought, that he was about to cure men of the fear of death 'by causing blind hopes to dwell in their souls?' They came, together with new cults, those blind hopes of an unknown future! When they came into contact with the achievements of knowledge, the transformation they underwent enabled them to cure us of the terror of death by developing the higher aspirations of evolving man.

Be that as it may, the acquisition of the hearth-fire, an emanation of the sun, was an event so indelibly graven on man's soul, that everywhere it has been celebrated as a great miracle. The Rig Veda is a resounding hymn of gratitude to Agni (*ignis*, fire). Even to-day our churches conscientiously light their candles without stopping to think that the flames continue the pagan cult of the Titan Prometheus, personification of hard wood (Pramantha, the Foreseeing), penetrating to the heart of soft wood (Arani), from which leaps the sacred spark. No doubt the faithful entertain no such thought. However, how can these fires be appropriate at the festival of Saint John, which falls on the summer solstice, when neither Jahveh nor Jesus alluded to the discovery of fire?

The Parsees of Bombay — last remains of the Zoroastrian Iran — have preserved as much as they can of the great Persian religion of the sun. These 'fire worshipers' no longer pray directly to fire, nor, in fact, to the sun as such. In order to aid the struggle of good against evil, they must, according to the Avesta, daily address at least sixteen prayers to Ormazd, creator of the world, and every morning scrupulously bathe in the urine of cows. That is the Nirang which, for the purpose of purification, they even drink

on certain occasions. They do no preaching in the vernacular. At the temples the invocations are made in Zend, the language of Zoroaster, which none of the faithful understand. The majority even of the priests could not translate their sacred texts. There is no trace of a cult either of fire or of the sun, but there is a sentiment of mute veneration for both. The whole world pays homage to the commercial intelligence of the Parsees. Very cultivated and urbane (as I can testify), they have controlled the commerce of Bombay. In their 'Tower of Silence,' they let their dead be devoured by the vultures, so as not to defile the earth by depositing corpses in it, or even fire by letting it consume them. When they were driven from their country, they carried with them their rites, last vestiges of Persian patriotism. It was among the Parsees that our heroic Anquetil-Duperron discovered the sacred texts of the Zoroastrian ages. They do not expressly call themselves fire worshipers, yet they are the only people in the East who do not smoke. They recoil even from the idea of extinguishing a light.

In the first centuries of our era, through the increasing influx of Asian barbarians into the Roman legions, the solar cult of Mithras kept pace for a time with the fortunes of Christianity. At this point I will introduce to you the god Mithras, one of the most ancient divinities whose names survive in history. Long before the Persians and the Hindus became separated, he existed simultaneously in the Vedas and in the Avesta. More than fifteen centuries ago he reigned supreme from the mouth of the Ganges to Mauritania, to Gaul, to Great Britain. In the first century of our era he was almost unknown to the Greco-Roman world. In the fifth century he had entirely disappeared. Apparently, traces of his passage are found in Manichæism, a doctrine which sought to reconcile Zoroaster and Jesus Christ. Renan tells us that had Christianity been defeated, we should have become followers of Mithras. Max Müller states that, but for the victory of Salamis, our religion would beyond doubt have been Zoroastrian. Nothing more clearly proves how the fate of gods and of their human makers depends on human contingencies.

Mithras had 'mysteries.' It is not surprising. Goblet d'Alviella[1] has briefly outlined the history of this god, whose adventures were not included in the scope of the Avesta. The great column of the Louvre, reproductions of which are not rare, shows us the Mithrasian sacrifice of the zodiacal bull, the blood of which assures eternal life to the just after they have been resurrected from the dead.

It was in the astrolating of the Chaldeans of Babylon that Mithras was first deified as a solar god. Furthermore, his mysteries had an astronomical symbolism. Brought from the Black Sea under Augustus by pirates captured on the coasts of Sicily, the cult of Mithras, like Christianity at its beginning, grew up in the poverty of the Roman slums. Because his followers were scattered through the army, the popularity of his cult of fire spread. Those were the days in which the great battle of the gods was fought — a battle which has not yet found the philosophic historian it merits.

Had the Greco-Roman world accepted the divinity of Mithras, and had the cult, as happened in the case of primitive Christianity, been modified to adapt it to the intellectual conventions of the time, is it quite certain that the mental revolution would have been as complete as people like to think? Would it not have been a change of names rather than of ideas? Intercessor, Mediator, Redeemer, Mithras, of whom Julian was, on the whole, the most shining disciple, brought to the world a monotheism from which the star of light ultimately rose — irony of things! — to the rank of a representation of the Invisible. He excluded women; but to them Christianity, with its Virgin Mother, an importation from Asia, was to offer an outstanding compensation.

In the end the power of feminine seduction was bound to master all hearts. The total defeat of the religion of Mithras was as sudden and as universal as had been its initial popularity. The fallen god had the consolation of knowing that, though the verbal forms of his cult fell with him, nothing was changed in history except a name and some legends based on an identical foundation of generalized emo-

[1] *Les Symboles.*

tion. After all, Mithras was fortunate not to have lived long enough to deteriorate into the brutalities of religious savagery. To the ill-starred if ultimately triumphant Man of Galilee, whose every word was love, fell the unhappy fate of passing from persecuted to persecutor. The Sun-King of the unfortunate Julian, with his angels and his theurgy, was merely the last temporarily successful counter-offensive. Victorious Christianity marched triumphantly to its pompous failure.

THE CULT OF THE HEARTH-FIRE

From the earliest times the worship of fire necessarily presided over the domestic hearth, around which the whole family life was to develop. The flare of the flame on the altar toward the sovereign star was the natural expression of gratitude for so many favors. On the hearthstone (Hestia, Vesta) rites suggested themselves at every moment of life as a precautionary utilitarian practice.

Fire was not to die through the fault of man. It was a god — a god to whom eternal gratitude was due, a god that could not be brought back to life except through the primitive rite of the penetrating male wood and the penetrated female wood.[1] There could be no hearth without its altar for the perpetuation of the sacred fire.[2]

High priest of the domestic altar, the father of the family is the permanent pontiff who assures the stability of the family. This time, indeed, the god becomes real, not only because he glows with life-giving ardor, but especially because he creates and maintains the organized life of the married pair and of their children. Therein lies the true miracle of terrestrial fire, namely, its permanent virtue of uniting the two sexes for the social function of establishing a posterity. Even to-day the word 'hearth' means the home, which forever thrills men's hearts.

[1] In the Sudan, in spite of an oversupply of Japanese matches, I have seen fire made in that way; also in India.

[2] As for Hellenism, that great stone of the altar of Zeus on the heights of the Pnyx, where it can still be seen, is merely emblematical of the hearth. The same remark is doubtless true of the sacrifices of Israel and of the 'Burning Bush' of Mount Horeb.

Male transmits to male the duties of the head of the family, and so perpetuates the ancestral hearth, and in the cult of the family will be found the cult of the dead who founded it. First honored and later deified under the name of Lares or of Manes, the dead became objects of worship, in which funeral feasts, libations, and symbolic offerings of food, with their accompanying rites, created an unbreakable tie between ancestors and descendants.

Thus was developed the special character of domestic worship. In Greece the temple was never anything except 'the *house* of god!' The city was nothing more than a development of the family hearth. Later the special gods of the tribes, endowed with the prestige of the prominent families of those tribes, were imposed upon the general public, but with this peculiarity: the priests in the service of each particular god were invariably members of that tribe which had given birth to the god. Such was notably the case of the Demeter of the Eumolpidæ, and of the Athene of the Butadæ.

Alas, against the contending influences of those numerous and sharply individualized divinities, the natural cohesion of the tribes was too often disastrously inadequate. In spite of the latter-day Panhellenic Zeus, the cities of Greece did little but destroy one another. It took Macedon and Rome to give to an enslaved Greece the painful compensation which, according to the witticism of Horace, allowed it 'to conquer its uncivilized conqueror.' And it is, indeed, from that last victory that our modern civilization sprang.

Before the great disintegration of Pamir, the same rites of the hearth prevailed among all the branches of the migrating Indo-European race. In the worship of fire, India, Persia, Greece, and Rome met their brothers of the valley of the Oxus on common ground. The most beautiful hymns of the Vedas are in honor of fire. Thanks to the Christian perpetuation of the Hindu purgatory, we have kept the cult of the dead, though we have replaced the libations and the offerings of food on which the Egyptians laid so much stress, with prayers, with masses paid for with money, and

with all manner of verbal aids for the benefit of unhappy souls afflicted by those catastrophes in which eternal benevolence delights.

CHANCE ENCOUNTERS

If primitive man had regarded the universe as insensible, how would he have approached it? How could he have even conceived any procedure for a preliminary investigation? Yes, words led our fathers astray, but in view of their natural shortcomings how could they at the start attack the formidable barricades of phenomena in which there was no apparent breach? The primitive state of developing man could not supply him with the methods, or even with the idea.

That an explanation of the world based on the assumption of divinity was the first which offered itself to the human mind, and that through popular ignorance and the coalitions of interested oligarchies it has been perpetuated even to our day, shows only too clearly how fatal it is to explain the object in terms of the subject seeking to understand it.

The misfortune of our contemporaries is that they experience too much difficulty in freeing themselves from an ancestral frame of mind, which had its reason for existing, but from which all intellectual value is now exhausted. All we need do, however, is to give precedence over the hasty conceptions of ignorance to the explanations derived from a more thoroughgoing observation. The 'hypothesis of a divine power,'[1] as Laplace would have said, is exactly commensurate with the primitive men who created it. We are no longer primitive men; that is why we need a state of mind that follows not too far behind the victories of experimental science.

In spite of the dour resistance of dogma and of the social

[1] To Napoleon, who asked Laplace why he had not spoken of God in his cosmogony, the philosopher replied: 'Sire, I had no need of that hypothesis.' Laplace had the spirit of a courtier, and his letters to his son, if sincere, show that he was a deist. However, according to the *Journal* of Gourgaud, Napoleon many times refers to Laplace as an atheist.

interests that are attached to it, our minds evolved within the limits of that very hypothesis. What a distance we have traveled from the first fetish to Agni, to Brahma, to Jahveh, to Buddha, to Christ, to the purely verbal god of pantheistic metaphysics! Spinoza, with his 'God' fettered with unbreakable laws, describes little more than a zero. Atman, Brahman, the more or less limited Universal Being of Indian metaphysics, appear much like those innocuous snow-men that melt in the sun.

What is 'error?' A discarded hypothesis. I am willing to go so far as to say that our 'truth,' since it cannot be total, holds an element of 'error,' the limits of which remain to be determined. Whoever fails to attain the absolute should take into consideration that lack of perfect agreement between our ideas and reality which we owe to the workings of our relativity. This I say in excuse of the gods, such as they were, who could not but exist, since they existed, and who, in spite of the dearly bought immunity of their slanderers, even now almost exist.

What shall we say of all the first unnamed and unnamable gods who rose from the night of things only in time to fall back into it again, without leaving the trace of a dim memory of themselves? They came, they went — a stone, a cliff, a tree, a beast, a cloud — things that to-day we pass unnoticed. The 'Omphalos' of Delphi, the rock of Solomon's Temple, the black stone of Pessinus, the black stone of Romulus, and the black stone of the Caaba, all still extant, were concrete realizations of divinities. We meet with masses of them in India, for India superimposed all religions, and so syncretized all the Powers of the universe that, no matter where they came from, she refused to do them the discourtesy of denying them. To the simple minds of our missionaries nothing is more embarrassing than such religious hospitality.[1]

[1] Apropos of this remark, I allow myself to add that in India (where schools are conducted in English), our Roman Catholic missions have no appreciable effect even in spreading the French tongue. A class in French in the schools accomplishes no more than a class in English in our 'lycées.' A former French missionary, who had left his school with the approval of his superiors, and

In the obscurity of an incomputable chronology we cannot discern even incipient form in the uptilted stones passing as gods, and stammering no one knows what to the flagstones of Gavr'inis, the undulating lines of which may perhaps be intended to represent the neighboring ocean. The original symbol? Why not? Later, we have amorphous sketches of the human figure or even those disconcerting personages of Easter Island which almost seem an impotent effort of the stone to become a person. But that is a chapter of which we are completely ignorant.

It is idle to expect a methodical order of continuous development, and humanity is slow in devising one. This very day man is 'diverse' and even contradictory, as we see not only in individuals, but even in the divergent evolution of various races. So decree the inextricably confused hereditary characteristics that, according to time and chance, express themselves. The apparent unity of the elusive Ego is one of the primitive sensations of which we cannot rid ourselves in the midst of a social life which demands at least the appearance of provisional stability. That does not deprive us of an implacable power of analysis by which that intangible thing we call 'right' quite simply resolves itself into a dominating force. It is easy enough to understand why the great phenomenon of gregarious life contains many contradictions.

In the caves of the quaternary age the nascent social life of that day is depicted only in outline sketches of ceremonies in which attempts at engraving or painting fabulous deeds figured, and which perhaps encouraged man in his effort to live, but which must often have disappointed him. Confidence and disappointment were to alternate in him ever after, but hope was to be extinguished only with his life. Such was the history of religious illusion, identical with that

who had become an excellent curator of Burmese antiquities, found it impossible to teach French either to his wife or to his children. At Ceylon, I presided at a gymnastic festival of a French missionary school with the bishop at my side. Though a pure-blooded Frenchman, he made a speech in English, to which I had to reply in English, because otherwise the pupils would not have understood us.

of all other illusions! The guide who misrepresents the distance still to be traveled enheartens the weary traveler. Is it too much to ask of man of to-day that he discount the time when he will no longer be deceived?

Our gods, which resulted from attributing human will to the world-activities which they symbolized, whether arising from primitive crudity or from metaphysical subtlety, have been unable to assume any forms other than those of magnified men and women. This anthropomorphism at its best is well exemplified in the growth of the Hindu and the Greek myths,[1] in which worthy demigods served as connecting links between man and the superior divinities. Following the same tradition, our worthy 'saints' continue in an intermediate stage between the human and the divine. Instinctively the faithful run to them as to influential spokesmen.

Euhemerism, with its theogony of deified heroes, sufficiently defines the problem. Our just veneration of the great minds whose solitary toil succeeded the sensational labors of Heracles, was the natural starting-point of the semi-deifications to be found in so many anthropomorphic legends. The Buddha, the Galilean, and the Bab are the youngest of that superhuman company which now is still going its way.

As to the divine mentality, man necessarily conceived it as similar to his own. The wrath of Jahveh,[2] of Zeus, and of all the other gods in certain moods represents the wrath of omnipotent men. Finally, is not the gods' lack of foresight the hall-mark of their humanity? Jahveh, after he had many times declared that his creation was 'good,' saw the fall of Adam and of his descendants. Had it not been for Noah's Ark, God would have destroyed the human race soon after he had created it.

Our primitive divinities, closer to a humanity that even then was always begging, and that for that very reason is

[1] Even in Greece the carnal relations between the gods and human beings assumed the proportions familiar to us all.

[2] *Dies Iræ.*

like us, had, like the gods of every period, their tribute of honors in multiple forms. A whole commerce of offerings and graciously accepted homages went on. The spectacle is familiar enough to us. It is that of giving in order to get. Sometimes, man, disappointed, turned to some different power and tried his luck anew. Even to-day does not the African beat his fetish if it neglects him? [1]

Constantly meeting disappointment, the man of the earliest ages had, in order to turn rebellious nature to his own advantage, to provide himself at every moment with fetishes. His stone axe and his cudgel were of considerable service to him. But in his case means and ends had too positive a relation not to tempt his imagination to go beyond. The aid of the Invisible was not too great if man was to attack the task of living in a world which at that time was total mystery.

How anything and everything could become a fetish I need not explain, when even to-day so much fetishism survives in 'civilized' countries. Stones, shells, wood, whether worked or not, leaves, spears of grass, fragments of no matter what — in them, under the guise of lucky pieces, as we still call them, you have the first rude sketches of our gods. Our divinities had origins that accorded with the measure of our minds. Amulets, relics, crosses, scapularies, medals, glass beads, and symbolic objects of every kind clutter the jewel-boxes of contemporary Christians. Their significance is the same as was that of those numerous fetishes of the ladies of Pompeii and Herculaneum with which the secret museum of Naples is filled. An old relative of mine, a very pious woman, showing me one day her assort-

[1] Not 'savages' alone beat their gods and abuse them when they fail to give satisfaction. See in the *Song of Roland* the abuse and the rough treatment that was inflicted by the soldiers of Marsiglis on their gods when those divinities gave the advantage to Roland. 'They ran to Apollo in his crypt, found fault with him, indecently abused him: "Ah, bad God! Why hast thou so shamed us, why hast thou suffered the ruin of our King? To him who serves thee well, thou makest a poor return." . . . Then they took from him his scepter and his crown, threw him to the earth, beat him and broke him with blows from stout cudgels; then from Termagant they snatched away his carbuncle. Mahomet they cast into a ditch, and swine and dogs bit him and trampled him.' (Joseph Bédier.)

ment of talismans, from which she never parted, called my attention to each in turn. In the collection I noticed a small bit of metal of indeterminate form. I asked its use: 'All I can tell you,' she replied gently, 'is that it is gold, and that it protects against carriage accidents.'

If it is the privilege of the fetish to have been the very first god, and to have remained strongly bound up with the most childish instincts of human nature, we should not be astonished that it has survived divinities that are more fragile, because they are more refined. The fetish has never persecuted any one, and it still prospers abundantly.

From the stone fetish to the animal fetish is but a step. The latter we find in the famous totem, the sacred animal which ruled over the tribe. After the motionless fetish that was man's first creation, the living totem was an impressive god. It was active; you could see it move; it showed a will, and each one of its actions could be translated into a particular myth to be used by worshipers.[1]

This is exactly what we see in the engravings and paintings in the caves. Mammoths, bison, crocodiles, stags, boars, cows, doves predominated in the world. 'Tabu' — that is, not to be touched — they demanded rites, and, doubtless, in their chapel caves they were paid them. Even to-day the monkeys and the cows of India have not surrendered these rites.

Logical order requires me to mention here men who, according to the formulæ of Euhemerus, were deified in recompense for real or legendary services that won public gratitude. I have already referred to them. The well-known cult of heroes, conquerors of monsters, is easier to explain than many other cults, but, although it belongs to a remote epoch, yet it presupposes a social organization of somewhat advanced form.

'God made man in his own image,' says the Book of Moses. To-day that formula seems nothing more than an inversion of terms. The fact is that man imagined God,

[1] Notice, for instance, the horses of Achilles telling the hero of his destiny at the moment of his starting for battle.

according to the highest standard of form within his mental reach; in the form, that is, of his own personality. How should he have done otherwise? Xenophanes said that if horses had gods, they would imagine them with the face of a horse. But man was not content to make merely the physical god in his own image, as he represents him in his pictures and in his statues; he felt bound to create the mental and moral god according to the same standard, with the human sentiments of approval and disapproval — as our 'Holy Scriptures' prove. The gods are all gods with human passions, everywhere and always, and religion can no longer make us see anything more than an incongruous relation between the worshiper who is wholly without power and the universal autocrat whose power is absolute. What room remains for that human liberty which we are always invoking? Even human dignity collapses in the abasement of bewildered subjection.

RELIGIOUS BARGAINS AND THEIR RESULTS

At the point to which I have brought *homo religiosus*, face to face with his fetish, he remains the authentic exemplar of the intellectual beginnings of man. The name of 'Father,' required by the god, is convenient for keeping the believer in the permanent subordination of one who must implore help at every moment of his life. The simple relation between man and the divinity consists in man's always asking, but receiving only by accident. The supreme art of a tenacious piety lies in finding contentment therein.

What other relation could have been established? The performance of the original rites, now wholly fallen into disuse, pretended to nothing less than forcing the divine decision. Priestly power does not now extend so far. To-day it does not go beyond inciting to hope. Humanity's whole function is to please God by gifts and by an exaggerated flattery, as if between human beings. How can Absolute Perfection value the praises of the Imperfect?[1] Is not the

[1] An eminent Japanese, O. Kakura Kakuzo, in his *Book of Tea*, has recently proposed that we start, without expense, without a priesthood, and without

distance too great between the Great Whole and the little terrified human beast? Consider, also, that man has no gift to offer God that is not already God's. What egregious folly to give what you do not own to him who is the veritable owner! What do flowers, gilt paper, perfumes do but degrade God to the state of one addicted to the pleasures of the eye and of the nose?

As for that divinity, talked of rather than really conceived, everything we do in the hope of raising ourselves to his level merely results in bringing him down to ours. What connection can exist between the infinite, which, since it has no limits, is formless, and therefore without possible objectivity, and the imperceptible organic accident which aspires to treat with that which overwhelms it?

Religious bargains, dignified with the name of offerings or of sacrifices, probably consisted for the most part of modest displays of the products of the earth,[1] which, in the course of time, had been substituted for the living victims that were offered up in the first attempt of savage propitiation. Since the law of man is to kill in order to live, what could be more natural than to kill in order to prosper, in order to offer to the gods the first effusion of blood, when in primitive belief the rites of sacrifice, if exactly performed, were bound to constrain the will of God?

That human sacrifice preceded that of the firstlings of the flock would seem to be indicated by the slaughter of Isaac demanded of Abraham by the God of Israel, and by the contemplated murder of Iphigenia at Aulis, who, however, was humanely replaced with a hind. It is the story of man

sacrifices, the religion of the Imperfect. To encourage us, he does not hesitate to tell us that he has discovered the absolute. 'The absolute,' he says tranquilly, 'is the relative.' In all that there is perhaps more sense than you might suppose. The Japanese are wise, and even witty.

[1] Near Java, in that odd island of Bali, which has remained of the Hindu religion, you can see set up at the doors little bamboo tables for the offerings of fruit, which, I was told, show that there is some one ill in the house, or that there is some other subject of sorrow to bring before the divine tribunal. It must be that misfortune is common, for I saw these tables before every habitation. It is needless to say that in the end the devotee dined on the offering, since the god did not take it.

seeking to buy freedom from his woes by sacrificing what is most precious to him. The closer the sacrifice was to his flesh, the more efficacious he might expect it to be. The gods were athirst. They had to be satiated with blood. Abraham offered his son without a sign of regret. Agamemnon groaned, but sent his daughter to the sacrificial knife. The law of religion is to assure one's self of the protection of God, regardless of cost. Men and divinities — cannot any one see that their psychologies are identical? Furthermore, through the inhuman authority of a pitiless religion the barbarity of Heaven would naturally outlive the plain savagery of earth. Not so long ago, the grandson of Louis XIV, having become King of Spain, presided at *autos-da-fé*. That seems to be ended. However, the *autos-da-fé* of 'hell' will never end.

Gold, silver, and precious stones have been from the remotest times, and still are, the ordinary gifts for the altar, and in all that time no one has ever dared to ask why the Great Maker of all existing things should value one sort of matter more highly than another.[1] And if the only point is to dazzle the masses, can there be a worse example for people to whom we continue to teach that, contrary to general practice, poverty is meritorious?

Obviously such ostentation could end only in money transactions. If ceremonies of the poor or ceremonies of the rich could have any effect in the celestial abode, how could the Son of Man, who had not a stone on which to lay his head, attribute such superiority to the treasures of this world, which are, the Evangelist tells us, the source of all iniquity?

Not that the morality of gods and the morality of men have necessarily kept step. God had the power to settle all

[1] The Christian, of course, avers that he intends simply to *sacrifice* what is most precious to him to the Universal Being. That doesn't answer the question how the Supreme Lord can derive pleasure from receiving what is already his own. Finally, whoever is possessed with the idea of sacrifice is always free usefully to lavish his gold on the poor instead of consecrating its sterile magnificence to the absurd aggrandizement of his God, who cannot be aggrandized.

accounts, and man could only submit to the divine pleasure. From the earliest days, the gods entered irresistibly into affairs in ways appropriate to the savage times in which they appeared. What they were created to do, they did, and have continued to do, changing with the progress of their creators, but changing more slowly than they, since a superior stability is the first attribute of the divine. Thus it was man who unconsciously forced kindness (humanity) on his Heavenly masters. In spite of religious teaching, human pity extinguished the fire around the stake. When Artemis denied herself the blood of Iphigenia, and Jahveh denied himself the blood of Isaac, what can we see in their action except the effect of a human compassion which could no longer tolerate the earlier barbarity? Indeed, the gods necessarily evolved step by step with men, and were guided by the universal determinism that imposed on them all, willy-nilly, a softening of the emotional nature.

Since mental states and moral states, both human and divine, have the same origin, they must develop in parallel forms. Man made God in his own image, yet he made him different too, since he exaggerated him out of all human proportions. Each, once established in his special domain, could but follow the law of his evolution. The weakness of one and the omnipotence of the other set up between them the inevitable relations. In those reciprocal relations, men and gods could but yield to the development of their component qualities. Man inevitably received from heaven the idealistic aspirations that he sent up to it.

However, his incapacity to keep up the dream amid the developments of his own relativity quickly forced him to see the disparities between the realities of human life and the facile precepts of a god for whom, personally, vice and virtue could have no meaning except in so far as he had assimilated a human quality. Man quite easily resigned himself to the fact, and verbally at least proceeded to reconcile every contradiction, while he devoted himself to making up for the inadequacy of his fine words by an unavowed enjoyment of his own imperfections. Thus, the

hours of collective happiness of men came to consist principally of the magnificent idealism which they talked, and on which the empiricism that they lived prided itself. That verbal idealism is, we are told, the foundation of our morality, the explanation lying in terrestrial sanctions and divine supersanctions more pitiless than our own — in spite of the precious offset of an ultimate felicity so tenuous that no one so much as tries to make us, even vaguely, perceive it.

However, the gods and their attendant demigods lorded it on easy terms over a domain in which their errors went unpenalized. There was, indeed, the case of Satan, brother of the Zoroastrian Ahriman, who used his approximate perfection as an archangel as a spring-board from which to leap to his ruin. Nothing could be less encouraging for our individual and too obvious imperfection, especially as the fallen angel, promoted to the rank of tormentor-in-chief, should have been consoled when he reflected that, had he not sinned, the Supreme Being would have been deprived of the punishments which he intended for the man whom he had created to fall!

Let us not abuse our opportunities of learning. The gods, holders of all that is good and right, foresaw all that could be wrong and evil, and knowingly and willfully indulged in it. Since they are free of any restriction, use and abuse are for them indistinguishable. Let us worship them. The contrast between their arbitrary behavior and the sublime ideal which they represent has never shocked the faithful of any period. I have already spoken of the naïveté of the good Polyeucte. It is no less true that the legends of Olympus are not, as a whole, edifying. Under the wing of philosophy, the ethics of Hellenism seems not to have been sensibly affected. Even with the help of a religion based on charity, we should perhaps find some trouble in pretending that the present morality of Paris under the spiritual authority of the Church is superior to that of pagan Rome under Augustus, or even to that of Athens under Pericles. Read the newspapers.

Christians do not fail to plead the contrast between the multitude of charitable establishments in modern times and the uncompromising individualism of antiquity. Indeed, the contrast is a fine literary theme for those addicted to the systematic exaggeration of appearances. Does the natural growth of human pity, which is universally preached even by those who disdain to attach to it any compensating reward, proceed from the common substance of humanity? Or should it be credited to a religious teaching that has quickened a sensibility common to us all? Not to go farther back, Buddhism, to which divinity is unknown, gives us the answer, for it preached and practiced the doctrine of universal pity better than it has ever been preached and practiced. Consider the atrocious contrast between the charitable doctrines and the inhuman brutalities in which the priesthood, with a view to our edification, launched forth during the period between the triumph of Christianity and our own times.

Was it not rather from the revival of a philosophy of nature that the effort to attain a human charity superior to the selfish interest inspired by the hope of reward in another life had its origin? And even this came late! In my youth I once arrived at dawn in the Christian city of London, and I saw the steps of houses and the sidewalks encumbered with pitiable creatures of all ages and of both sexes trying to sleep in the frosty night air. Such was the drawback, which at that time was regarded as inevitable, of a great advance in Christian industrialism. It required time for the idea of night asylums to arise. And how many more urgent needs there still are!

If words were all we needed to attain a superior morality, we should have attained it long ago. But both the vivid imagination required for idealistic flights and concentrated personal energy are needed to produce those spontaneous actions which make us pass from the pleasant anticipation of a future ideal state of affairs to manifesting actual disinterestedness. It is a combination not ordinarily met with. I can but approve all those persons who do good; the only

condition I make is that they do not cry it so loud and long from the housetops that they get an exaggerated idea of their individual merit. Our ideas have always aimed in the right direction. In all times and in all lands, all religions and all philosophies have never gone beyond recommending the exercise of the virtues, justice, benevolence, love of your neighbor.[1] How often has anything come of it but the continuation, in fact the increase, of brutalities and murders? Civilized lands are covered with temples in which art has used its most magnificent resources to enhance spectacular rites, and sermons to which the crowd rushes agape. A corresponding change in conduct is not, however, always apparent.

What can we expect of the future except consecrated verbiage? What practical results from the increase of sensibility except those verbal satisfactions in which we take such delight? Four hundred years before Golgotha, the teachings of Buddha, which even then were not new in inspiration,[2] had recommended the most all-inclusive doctrine of human charity, founded on a conception of the world which foretold the high aspirations our sensibility was to attain. There followed a thousand years of triumphant preaching and a return to Brahminical dogmatism that left no other memory of Buddhism in the country of its origin than a name. The case of the later Galilean parables, which in sum are evocations of fleeting emotions, is not greatly different.

There are moments when *a sigh is enough to lift the world*,[3] says an apothegm of Asia, and it is true. The contagious nature of our emotions is one of our finest qualities. Only it is too much a matter of time and circumstance, that is, of

[1] At Buenos Aires, where I was delivering a lecture, I ventured to rejoice over the fact that a religion recommending sin had never been preached. An English lady, connected with the diplomatic corps, indignant at my remark, questioned me hotly and left, slamming the door behind her. I met her the next day at the race-track. She had not calmed down. She did not hesitate to say that I ought to be publicly whipped. Behold your disciples, O Galilean!

[2] Witness Jainism.

[3] *Mémoires de Baber*, the second conqueror of India.

the mental mood of the unstable mob. At the arena, the common people thrilled with voluptuous frenzies, and the Vestal turned down her thumb demanding blood, while the best citizens, supposing that any such existed, made no protest. The Christians were thrown to the wild beasts, and in the universal degeneration the high-minded thoughts of Marcus Aurelius led to a reversion to the savagery of a Commodus, sad bequest of the paternal philosophy. Then came an hour made abject by the fatigue of its own excesses, and the sigh of Christ awakened the world from a ghastly nightmare, and tried to make the divine word of universal love live at least until the quick relapse into the bloody abyss. Perhaps the Christian sigh *did* 'lift' the world, but it was only to let it fall again as soon as lifted. What happened to the fine churches of Saint Paul when they came into contact with the first heresies? What sanguinary madness took possession of that Christian world, that martyr which in its turn eagerly sought to make martyrs? Remember the crimes of Constantine, of Helena, of Theodosius, founders of the Kingdom of Christ here below. Blood, always blood! Will the thirst of the gods never be quenched?

Five centuries earlier the 'sigh' of Buddha had already lifted Asia to the peak of its emotional capacity. Subsisting monuments attest that the great emperor Asoka had conquered India. Under Fa Hien, and Hiouen-Thsang, China, and later even Japan, had their day of glory. There were no religious outrages in Buddhist India. Universal tolerance was practiced in all places and at all times without ever needing to be formulated, as is still evident in Ceylon and in Burma. That was the noblest lesson ever taught. And then, at the cost of precious blood profusely spilt, came the universal collapse of Indian Buddhism under the subterranean effort of atavistic Vedism. Meanwhile that same Buddhism, driven from its native land, installed itself in eastern Asia, but only (as happened to the Galilean preacher) to deify its unfortunate founder and to join him with the very gods whom the Chinese apostles believed they had supplanted by him. Words had changed greatly, but

feeling and conduct remained as nearly as possible what they had been in the past.

Where are we, then? What should we seek, what should we desire, and what should we do in this confused jungle of superfluous divinities? Evolution requires new activities on the part of man, and we are offered no more than novelties of language that do not sufficiently correspond with the acts which they vainly preach and predict. Is not that because the problem is insoluble by the principles that theology and metaphysics obstinately impose on it? The ethics of divine absolutism with its pitiless punishments has produced none of the promised reformations. The victories of words have succeeded merely in crowning the prolongation of barbarity with pretty phrases. Though we have a sublime ambition for divine achievements, we have been unable to make progress, because we are unable to change anything by ourselves. Neither human idealism, hypothetically made real in celestial mansions, nor our venturously mitigated earthly punishments have produced the desired results.

Is there no other path to a more effective reformation? To renounce the always elusive 'divine' seems still too painful to those who must have words to live by. Is it, then, so hard to be what we are, exemplars of humanity, with no one to aid us except ourselves, and, by the same token, obliged to rely on our own abilities? That is too simple to satisfy our desire for show. To be ourselves seems harder than to excel ourselves. To persistent effort of will we prefer the transcendental talk that loses us in the clouds.

We can, however, easily see that the morals of those among us who live without regard to the teachings of the priesthood are no worse than those of any one else, and that these people have, besides, the incomparable advantage of avoiding all the pretenses of a self-seeking hypocrisy. Their heroic resistance to cruel persecution has made them the leaders of human idealism, and to them we owe our marvelous progress. Did, then, the teachings of the priesthood bring about the abolition of the frightful tor-

tures in which for ages our charitable 'Christians' came to take their pleasure?[1] What voice in the all-powerful Church was ever lifted to suppress the rack, the strappado, quartering, the pillory? Is it not a condemnation of the religious order that almost in modern times Vanini's tongue was pulled out by the executioner's pincers before he was strangled?

Clearly to show that the gods are all alike, we may cite the case of the great Averroes, who was led to the door of the mosque of Cordova where before going to prayer each one of the faithful conscientiously spat in his face. Afterwards he was asked whether he did not repent of having taught false doctrines, and his reply was that he repented. It is only the persecutors that never repent. In Abyssinia, one of my friends saw an old philosopher stoned for having said, 'I know why the world goes ill. It is because the good God has gone to sleep.'[2]

The King of Spain, Philip V (brother to our Duke of Burgundy), proclaimed that his humanity disapproved of bull-fights, but he had no reprobation for *autos-da-fé*. In the act of abdication that he addressed to his son, Louis I, that same Philip V wrote: 'Always protect and uphold the tribunal of the Inquisition, which may be called the bulwark of the faith.' At the carnival of Madrid in 1724 Stalpart, describing masquerades spiced with an *auto-da-fé*, wrote: 'There has been a festival in the city which was highly diverting to the people of Madrid, and I know nothing, ex-

[1] In many cultivated and even liberal minds we still find an ancient substratum of fierce intolerance. In England some years ago I met in a drawing-room a young clergyman who was, I was told, very scholarly and of very agreeable conversation. When I allowed myself to make I know not what remark implying condemnation of the historic brutalities of the Church, he — a Christian 'heretic' — was very eager to claim part of the responsibility for what was done before the schism. I tried to clear my skirts by limiting myself to an appeal to his humane sentiments. That amused him greatly. 'Oh,' said he with an amiable smile, 'a bad quarter of an hour is quickly over.' It was an exclamation worthy of Calvin when he had Michael Servetus burned alive.

[2] In the matter of lapidation, the simple people perform their own executions without the vain formalities of 'civilized' judgments. Their action is a notable improvement over the common run of our hypocrisies.

cept a bull-fight, which so well expresses the genius of the people. It was an execution of Jews. They burned one of them alive, two more after strangling them in sight of the stake, because they were converted or pretended to be, and the effigies of six others who had died in the prisons of the Inquisition, and to-day they whipped four through the streets of Madrid to the great delight of the people. The ceremony was carried through with much pomp and joy.' [1]

Every one knows the horrors that followed the revocation of the Edict of Nantes; theft of property, crimes against the person, children torn from their families with a view to their forced conversion, etc. Even when the savagery began to abate, Madame de Maintenon persisted to the very end in favoring the kidnapping of children.

I quote the following passage from the report of Villars, an eye-witness of the execution of a band of Protestants in the Cévennes Mountains.

'Maillé was a handsome young man, intelligent above the average. He listened to his sentence with a smile, crossed the city of Nîmes with the same air, begging the priest not to torment him, and the blows that he received did not alter that air or extort a cry. With the bones of his arms broken, he still had strength enough to signal the priest to stand back, and as long as he could speak he encouraged the others.'

On the expedition against the Vaudois those abominations were exceeded, as is shown by a letter from Catinat to Louvois. Louis XVI, not content with outraging men's consciences in his own kingdom, obtained permission from the Duke of Savoy to continue like persecutions in the Valleys of the Canton of Vaud. Catinat, in charge of the task, gave an account of what he had done in these terms:

'This country has been completely laid waste. There are in it no longer any people or any domestic animals. The troops were bothered by the ruggedness of the country, but the soldiers were well rewarded for their trouble by the booty. The Duke of Savoy has approximately eight thou-

[1] Comte de Pimodan: *Louise-Elizabeth d'Orléans*, p. 71.

sand souls under his control. I ordered the troops to show a bit of cruelty to those whom they found hidden in the mountains, and who put us to the bother of hunting them out. Those whom they took with arms in their hands, and who were not killed, were disposed of by the executioner.'

Since the eternal cauldrons of God, the tormentor, have not made 'believers' of us and, what is more, since the glory of staying the hand of the slayers is due to the propaganda of unbelievers, is it not time to ask ourselves whether the simple scientific conception of man and of his universe may not produce a better life? To awake from a sanguinary dream of the empyrean only to return to earth may be painful, but have we not been told from above that we are but dust and that to dust we shall return? — a remark that does not too well accord with the joys of paradise and the pains of hell. All in all, is it not possible for us to remain merely good children of the earth, without other ambition than that of making the most of ourselves in the terrestrial conditions from which we cannot escape?

THE LAW OF MAN

Whence comes that morality of which the conscientious bigot and the dyed-in-the-wool bandit speak only with downcast eyes? Let us candidly and fearlessly go back to its source. The gregariousness of certain animals requires a social order of some kind. In spite of their total lack of vocal powers, the ants and the bees strikingly illustrate the point. Signals, clear to all concerned, create a whole code of rules, customs, manners, and 'mores' that in their turn create a moral synthesis in which the interest of each and the interest of all are intended to be equally safeguarded. Customs make individuality, for they indicate the degree of social progress from the egotism of a minimum of coöperation to the altruism that has no moral value except as it is free from all expectation of reward.

A herd of grazing cattle so distributes the duty of keeping guard that no one can approach it without being examined by an interested eye. At the entrance of the hive bees

always have sentinels to withstand any dangerous intruder. The life of ants abounds in traits of that sort. The word 'instinct,' much in use as a name for spontaneous coördinate action among animals, designates that group of mental phenomena which our hairsplitting vanity, intoxicated with metaphysics, declines to class as the effect of reasoning.[1] And yet, as between animal and man, there is nothing that calls for a special name to express an identical transition from phenomenon to phenomenon, except, perhaps, degrees of consciousness hard to grasp. If we are to hold to the word 'instinct,' we must first agree on what it means. All that can be said to-day is that in all social organizations differences in sensibility establish a corpus of manners — that is, a moral code for all and for each.

Consider for a moment the following phenomena: Birds building nests in couples with selected materials and with every adjustment for safety, watching over and starting the young in life, adopting means of defense and sagacious methods for avoiding traps, methods of flying in triangular formation so as to incur the least fatigue on long journeys, and the replacement of the leader at his first sign of fatigue with a comrade assigned to that duty; finally, the marvelous migrations of great flocks of the light, feathered creatures describing in the air bold evolutions without a single one's ever losing his allotted distance from the others — something so hard to obtain from the soldier at manœuvers by clamorous orders. In the Sudan I have seen flights composed of millions, perhaps billions of individuals. The air

[1] Why does it happen that at laying time the female martlet that makes her nest in my garden pecks the wall for the chalk she needs for the shell of her eggs, whereas the male remains on the lawn to pick up worms? She certainly does not set up a train of reasoning such as that which language allows us to construct, but she directly satisfies a physical need when it makes itself felt. Our savages act in the same way before they begin to analyze. The sitting hen that turns her eggs to equalize the application of heat does not formulate any theory of thermodynamics. She is no more ignorant that young ones are to arrive than is the insect that provides food for the progeny which it will never know. Since she engenders and distributes heat, she wishes each egg to have its share. By whatever name you describe the phenomenon, it remains a reflexive process that is common to all animals, including man.

was darkened with them as at the approach of a storm; never was there a collision when they changed their direction, never the slightest disorder in the ranks.

Every cock notifies his hen of any treasure-trove he finds and makes her a present of it. How many men do as much? How often have I, with the cruelty of youth, killed a hen partridge that fluttered in front of me in easy range in her effort to save her young! From such incidents Darwin drew appealing pictures that surprise the reader, for they show how remarkable is the likeness of feeling and of thought in all grades of animal life, including man. In the case of man self-denial provides material for sublime oratory. Why should self-denial be unworthy of notice in the case of a beast, when his self-sacrifice is more costly to him than man's, since the beast expects no other reward than that of satisfying a disinterested devotion?

In view of the organic affiliation of animal species, which we have finally recognized, can we maintain our belief in the existence of the chasm that our theologies have artificially dug between soul and instinct? What could be more natural than to see organs which are so clearly akin as ours and the animals' produce corresponding results? Should that astonish us as much as the incredible pains that human beings have taken to break the very evident and actual bonds of common descent?

Would it not be the part of true nobility to accept the world as it is, and to give up our puerile attempts at self-exaltation by the pretense of a majesty which misrepresents phenomena by using deceptive names? Should not experience master the obsession of dreams which try to rivet the real links of our life to the unrealities of our pseudo-deification of ourselves? From the smallest living creature to the greatest, not excluding man, the interrelations of the animal kingdom are scientific facts. If our organs at each successive stage of our descent are similar to those of the other animals, does it not follow as a law that they have common functions? If we attentively observe the actions of nature, we shall discover no creature in which we shall not find the

indication of sensations and volitions like our own.[1] Is it conceivable that identical organs with identical functions will not, as a consequence of their identity, release energy in an identical way? From organisms in action the same needs bring the same responses. The puerile vanity of our theological isolation can change no part of that.

The law of man, then, is to realize his exact place in the universe that surrounds him; whence arises the obligation of developing his individual and social activities according to his natural relations with the Cosmos. If he chooses to deny his organic bonds, so that he may attribute to himself an ultra-terrestrial eternity that contradicts all the known elements of his biology, his whole existence, personal and social, will be warped. He must make his choice between departing from his norm or bringing himself closer to it.

On the other hand, if maternal devotion is in the highest degree a part of the morality of living beings, have we any right to deny it due honor to the detriment of related creatures that show it in so striking a fashion? Is the incentive so to do, perchance, a fear of not making a fine enough appearance under the canopy of heaven? Truly the humble animal fulfilling his duty toward his own is more to be admired than we of the human race who need the lure of imaginary rewards to practice a correct conduct, into which pretense too often enters. The cock that gives away his feast, and the partridge that gives its life for its little ones, expect nothing from any feathered divinity, and no threat of punishment lies upon either of them if egotism carries the day. If the animal sacrifices himself with an admirable courage, who shall deny it the credit of having a morality? And since there is a morality among animals that coordinates their sentiments, thoughts, and actions, how can man decline the patrimony, the moral inheritance, of his common descent with them, when anatomically and physiologically that inheritance is credited to his account by anatomy and by comparative physiology? Does not all that cast a bright light on the formation and development of the

[1] Read Fabre and Bouvier on insects.

morality which, *prior* to all doctrine, our primitive tribes more or less organized?

It is true that we have the advantage of being able to formulate moral principles, metaphysically or even empirically ordered, although we formulate them less, perhaps, in the pure determination to realize them immediately than to satisfy a haughty dogmatism from which self-seeking is not always absent. Again, the impulsion of morality is doubtless incomparably more comprehensive in man than it is in his distant cousins. Wolves, however, have been seen to help one another in battle, though that, if closely considered, may be a form of egotism.[1] Are there no 'sacrifices' of our own in which self-interest plays a part? And does not the most magnificent part of our rôle lie in constantly preaching easily recommended virtues? Alas, the problem is less in preaching them than in practicing them!

As to the origin of our sublime precepts, we can easily enough understand that it seemed more glorious to receive them from a divinity than to recognize in them the prosaic results of our ancestors' first rude attempts at organization. But the only things which interest our theologians are those independent of science. The idea of building up a morality for man on the facts of his condition could not occur to minds wholly possessed with the idea of deification.

At bottom, is not the problem simply to succeed in getting from man through the law of progressively improved mental action the effort needed to comprehend that the well-being, the security, and the rational development of social life are strictly dependent on the well-being, the security, and the rational development of the individual? Is not this the origin of that conception of justice about which

[1] The discussion of social aid in time of peace would be out of place. The too just observation of Darwin stands: nothing more surely retards the proper evolution of the race than using the energies of the healthiest in supporting the degenerates that heredity propagates. The Athenians solved the problem by the Barathrum. But moral degeneration is not less dangerous than physical infirmity, and it seems hard to sacrifice a newborn child on a presumption of its eventual criminality. How much the 'Creator' owes us on the score of his disposition of our destiny!

our Revolution raised such a hubbub at the very moment when on the scaffolds it showed itself so ignorant of its real meaning?

Justice, again, cannot be made real except through the ultimate sanction of force, and since, till now, force has dominated the world at the expense of justice, the result is that the true problem continues to be that of interesting man less in words and more in the actions which words constantly disguise. Pascal said: 'As man could not fortify justice, he has justified force.' To make justice and force coincide is the whole political and social problem. Is it debasing man to judge him capable of a noble enterprise, even if his success is not always proportionate to his effort?

Superior to that formal justice, namely, the equal dispensation of equity to every one, is altruism, by means of which each of us can test himself by giving some part of himself to help his less fortunate neighbor. The trouble is that, instead of a general tendency to unselfishness, we too often see collective selfishness making continued assaults on the rights of others. Therein lies abundant matter for philosophizing, especially at a time when words of charity are pompously inscribed on every wall to excite with promises of earthly and heavenly recompenses the showy activities of an official altruism not always innocent of self-interest. From every church professional moralists hasten to the ostentatious meetings of spectacular charities, whose efficiency is rarely proportionate to their noisy pretensions.

Our church sermons do not accept the hypothesis of a charitable act done without hope of reward. As a result, we are generally asking for doctrinal formulæ in which we can most readily find an excuse for following the path of least resistance, and the Church by applying its energies to promoting religious bargains too often ends in cultivating nothing but hypocrisy. Is it, then, astonishing that the result is rather display than efficiency? We can be quits with ourselves for a penny in the poor-box or in the collection tray, and never be brought to suspect the high value of the self-sacrificing spirit and of the superior benefit that

every one of us can gather from it.[1] Which of us gives enough of himself, if measured in terms of what he really could give? Did not the great Francis of Assisi nearly become a cause of scandal in the eyes of the Papacy?

What should be done? I willingly recommend less doctrine and more empirical brotherliness; less counting on compensation and more genuine emotion. Reciprocity of feeling among creatures of the same kind can show itself in forms of compassion that are not man's exclusive privilege,[2] but that would give him an incomparable superiority, if the unpleasant accompaniment of punishments and rewards did not spoil it all. Where we should see a sacrifice, we see a desire for compensation. Self-interest takes the place of disinterested merit.[3] Let us courageously lift the veil and uncover the official poverty of a virtue that, since it is modest, will not even let itself be applauded.

I hasten to say that outside every category there are beings, in unknown ratio to the whole, who are simple and charitable in the finest sense of the words; men and women who are always prepared for every sacrifice without hope of reward and without fear of punishment. Unaffected by exhortations from the pulpit, they walk in the straight and narrow path, and point out to us the way, just as did the humble monk of Assisi, who lived and died in charity toward all. That is the great lesson so seldom taught; it is morality practiced on the high plane of humane feeling; it is not the morality which is merely talked, such as that which contents the great majority of men — a majority which

[1] When the crusading baron, on hearing the Passion of Christ recited, exclaimed, 'Would that I had been there with my men at arms!' he could not have understood that, had he been there, endowed with all his cherished stock of ignorance, he would have represented, as in the course of his feudal life he had always represented, the force of arms against the unarmed ideal.

[2] See in Darwin the story of the baboon that rushed down from his cliff to the rescue of a young comrade surrounded by a howling mob, and succeeded in saving him. He expected no reward. He was prompted by nothing except the moral need to forget himself for the sake of his neighbor.

[3] 'That action is pure which is done in no self-interested spirit.' (Bhagavad Gita.)

cannot comprehend that the mere fact of helping others helps us ourselves.

Since, instead of falling from heaven, our moral precepts merely express the needs of a life arranged for the advantage of each and all of us, there is a fair chance that we may, more or less successfully, realize some of them. It is merely a question of bringing men to recognize that there is no achievement of human society not based on a method of perfecting the lot of an increasing number of citizens, both as individuals and as members of society. We have a right to expect that institutions will facilitate moral progress, instead of hindering it by making too many compromises, as happens in social systems of every grade.

MORALITY EVOLVES

I know that in seeking in man himself the basis of human morality I shall gravely offend all those who cannot conceive of themselves except in connection with the good graces or the harsh punishments of Divinity. If there were any way to appease them, I should beg them to consider that as my inquiry concerns man and all that befalls him, I am forced to ask how he can govern himself.

I am fully aware of the theory advanced that man is governed from without by a jealous master whom he must incessantly implore. This theory assumes a knowledge of that master by intuition or by reasoning, the force of which diminishes as our knowledge of the Cosmos increases. Hence, I ask myself whether our ancestral ignorance, of which so many of the effects still subsist, may not in this delicate matter have gone astray.

I really think that the virtue of simple obedience, based on the fear of chastisement, much resembles the submission of an animal under the rod, and that, on the other hand, if, like Buddha, I were capable of conceiving universal love of all living creatures and of acting accordingly, I could draw from life a just self-satisfaction and could also offer an example to those who shall come after me.

Finally, I will point out that the functioning of our organism necessarily precedes any doctrine we can base upon it, which doctrine must result from a general consideration of its activities. It required the tardy decalogue of Sinai, long after Cain, to 'reveal' to us a divine morality. That is because individual and social morality began in empirical practices from which, for better or for worse, approximate rules of conduct were drawn later. And yet the difficulty was less to state formulæ than to get them applied, even in a modified form.

Whatever may have been the origin of our elementary morality, it universally aimed at bringing order into private conduct, as well as into human society, by restraining and regulating, more or less successfully, the doings of the individual. As was inevitable among the people of the earliest ages, the 'Commandments' of Moses, like those of Manu, at first enumerated the deeds from which we must abstain, without reaching the point of considering the refinements of positive action. The day for that was yet to come. Thus, morality, whether human or divine, had modest beginnings that go back to the days of the Fratricide who started 'civilization.' If there was a morality before the philosophers, as Louis Ménard liked to assert, there was even before them and before the gods an empirical organic morality which marked human evolution from the grossest fetish to Brahma, to Zeus, to Jahveh.

One point inclines me to give consideration to this theory; it is that in retracing the course of the successive human codes of morals, I meet again and again that organic animal morality which is merely the expression of the law of the strongest, tempered by the empirical law of adaptation, which resulted from the primordial need of self-preservation. Can I blame a fox when, because it is his usual practice, he kills a hen even though he is not hungry? Last night a big, villainous black cat destroyed the brood of my two friends the blackbirds — an example, however, set him by their coming into my garden to kill the worms with which they fed their young. The 'moral order' of a universe that we have extolled as divine would have it so.

Indisputably our God of Mercy made us carnivorous and so without our consent compelled us to kill in order to live. That need unloosed in the world, and still unlooses, incalculable atrocities which only rarely move us. We are inferior even to wolves, for we have set our teeth in the fresh-killed flesh of our human brother. The custom is of old standing; even to-day some respectable savages unostentatiously continue it.

Since we cannot help creating our God in our own image, the necessary result is that he evolves step for step with us. Having endowed him simultaneously with the extremes of paradisiacal benevolence and with the extreme of hellish cruelty, we see him pass from one to the other as our mentality varies. The wrath of God is the wrath of Moses; the charity of Christ toward the woman taken in adultery is the reflection of our own human pity. Indeed, the lesson acclaimed as coming from Providence is in reality but the echo of our own emotion. Though man did not at first realize the fact, divine law is the law that he made for himself.

Does our general morality show any signs of making immediate progress? I incline to believe that it does, since we are urged by posters to be 'good to animals,' a virtue that the Galilean never preached. The recommendation should be inscribed on slaughter-house doors. Not that I am leading up to the proposal that we become vegetarians. That would be pure childishness, since no one can say how many lives we end when we drink a glass of water. Man I am; man I consent to remain, for man is but one form of the universal determinism. To be wholly frank, I, having more foresight and more kind-heartedness than Divinity, shall even try to correct my inherent implacability by reducing, through growth in universal love, the sum of evil that from the day I was born I, as an individual, was condemned to accomplish. And when any one proposes that I live according not to human but to divine morality, I shall simply reply, 'Your perfect God did evil without being obliged to do it. Upon the imperfect man of the Cosmos devolves the special task of attenuating it.' Such is the formidable water-

shed by which the course of morality is inevitably divided!

Dare I say it? The universal sum of evil is so disconcerting, and the weakness of our resources is so wholly out of proportion to it, that the general inefficacy of our measures of relief is painfully apparent. And yet the best in us urges us to the rescue, were it only to save ourselves from the repercussions of the evil to which we are exposed. We are called to join in the noblest battle of man; we cannot ignore the summons. Vain sacrifice, some will say. That it will have little effect against the great sum of evil is but too true. Nevertheless, supposing the worst, how profitable for him who sacrifices himself!

Yes, call it what you will, that is the true base of human morality. To sacrifice self for an idea is to grow, to develop, to improve yourself, to perfect yourself. What can be the morality of the human being, and through him of society, ever advancing toward a more civilized life, if not the law of progress from one relative stage to another, the end of which he will not see? What use have we to-day for that crude armor of sanctions in which men of the earliest ages encased themselves? When we offend against the laws of nature, they do not fail to react immediately. Therein is the inevitable chastisement. Human sanctions — rewards and penalties — establish morality in a pompous setting of promises of celestial felicities — cheap, since they cannot be enforced. More modest and sure is the simple satisfaction in an act of abnegation of which we are too proud to speak, and which, without so much ado, brings to us the intimate sense of superior contentment.

Homer said that the gods wandered through the cities disguised as beggars, to learn by experience the justice or the injustice of men. How times have changed! Hercules in his lion skin, formidable herald of primitive conscience, carried justice everywhere. I notice that at every cross-road he has been replaced by the preachers of official virtue and the dispensers of honorable distinctions. I do not say that the world is any the worse for them, but I do not see that it is sensibly better. Certainly they have not de-

creased public hypocrisy. Perhaps we still need some thousands of centuries to perfect our feeble wish to do good. We may still hope, even to the day when we shall be willing to replace the boastful show of virtue by the modest and silent content that comes to us when we have done good without expecting a return.

Having descended from the clouds of metaphysics to the level of our empirical social activities, morality with all its train of natural sanctions must evolve according to the human quality of knowledge and of emotions, the fluctuations of which make vice or virtue. The mere idea of a variable morality seems abominable to those adherents of immanencies and transcendencies who claim that the eternal flux and flow of the universe can be controlled by words. Faulty metaphysics tries to detach from cosmic phenomena the idea (or rather the symbol of the idea), in order to confer on it the superior dignity of an independent existence, ruling the world instead of being ruled by it. Theology does precisely that, and aggravates the offense by personifying the infinite — thus marring the true drama of our destiny by the injection of phantasmal scenes.

Thus it begins to become apparent that, considering only actual moral conduct, the correlated activities of the living series reveal no more than an organic processus, in the development of which there is no room for the miraculous insertion of an insubstantial soul with its verbal attribute of superhuman permanence. If, therefore, my task being to find the true origin of the phenomenon of morals, I allow myself to maintain that the profound source is in life as it develops, I brutally shock all the professional thinkers who grimly cling to the verbal evolution of a morality based on abstractions for the use of mere talkers. In such morality we find that the profound problem of human life is swamped in the didactic classification of estimable virtues, chiefly useful for oratorical effects in sermons. They are empty theatricalities, not the vital things of life.

I grieve for those beautiful professional souls who build up oratorical effort at so cheap a rate; but, if we seek to

realize in our lives a simple average of acceptable virtue, free of public parade, we at once run counter to interests demanding certain attenuations of our altruism at which our elemental idealism is bound to be shocked.

The basis of universal morality is summed up in this simple formula: we must live with our fellow-beings. Shall we live at their expense or to their profit or under an agreement of mutual aid? Can there be any choice in the matter? We pride ourselves on feeling, even in its most minute shades, the value of our energy. We must choose between spending that energy for ourselves or for others; we have no alternative. As the social state does not permit a total egotism, since the simultaneous effort of the community would turn it against the individual who tried to practice it, the (at least theoretical) agreement of mutual help is forced upon us as soon as we try to formulate a law of organized life.

Obviously, the distance between word and act is still great. How many persons are there who pride themselves on a precept, only to disregard it as far as possible when it embarrasses them in practical life? For better or worse, the crowd, willy-nilly, holds to commonplace formulæ without troubling itself overmuch with their application. Only the best members of the community take pride in doing better than the mob. Paying taxes and not too openly trying to get the better of our neighbor is not enough to raise us in our own eyes. We have plenty of opportunities to do better. Altruism finds ample chances of expressing itself. A man whose heart is in the right place finds plenty of opportunities to love and to help, and many will be astonished to discover that the highest human joy is to give yourself.

I have already pointed out that the policy of mutual aid is common to all times and to all regions. Daily we see it practiced even among animals, though no prophet ever preached it to them. Is it not the feeling of a profound solidarity that unites the common weakness of living organisms when competing against an outsider? Would that be a becoming point at which to close our moral account with our neighbor? Have we no obligation beyond that of re-

buking second-rate people who prefer to allow a preacher to balance their accounts for them rather than to do so themselves by a direct personal act of human neighborliness?

Can we hope for nothing better from subsequent evolution? Between the morality of primitive man, which differed so little from that of the animal, and the morality of Epictetus, from which Marcus Aurelius drew such beautiful but futile effects, the gap baffles all our means of measurement. However, as much by the landmarks of biology as by those of our own history, we can methodically trace that marvelous evolution of humanity from bestial savagery to displays of mutual helpfulness which, in spite of the exceptions already noted, we see daily. The morality of metaphysics is one, unchangeable, absolute, whatever may be the human organism that expresses it. The morality of the human organism, throughout its continuous evolution, aspires toward altruism. It is the gradual result of gradual acquisitions of experience, little by little changing the descendants of the scarcely formed Pithecanthropus into a human company provided with a growing and effective power of self-abnegation whereby he who succors his neighbor attains an emotional nobility not inferior to any attribute of Divinity.

Every man needs his neighbor's help; that is the pole-star of our humanity. Standardized social aid is but a lifeless automatism, which, for the moment, tends toward a minimum of evil. The vibrations that pass from one human being to another are necessary to produce the noble fusion of decisive emotions. We should expect something better, but the future will have no productive value unless the evolution of the individual keeps pace with the march of time. We can try to teach men self-sacrifice by means of theories. No calculation of unknown chances, but the impulsion of the ideal will be the determining force in removing the discrepancy between our transient and relative lives and the incommensurable activity of the infinite with which we are brought into conflict. Whoever does not try to live above his own standards will make a failure of his life.

The most difficult step is to cease trying to get disinterested action from selfish interest. Take the morality out of a thing in order to make it moral? Increase egotism in order to check it? The result of such topsy-turvy education is obvious. To the atavistic tradition of primitive savagery we owe that stupidity. I count less on the didacticism of reiterated preaching to check it than on that 'Lamarckian habit' by which in some unmeasured time the idealistic impulses of continuously evolving humanity will be implanted in our reflexes.

All this comes at the very height of the universal carnage of lives condemned to kill in order to survive. A doctrinal synthesis of morals, that is, a universal system of ethics, drawn from universal murder! When Cain slew his brother, Jahveh had not bethought him, as he later did on Sinai, to say, 'Thou shalt not kill.' Heaven is our witness that after as before that day, the universal slaughter knew no pause. Hell and paradise have the task of settling, now that it is too late, the accounts of a defective creation. I hear the sheep complaining that there is no hell for the wolves, and the wolves plead the example of man.

If there were anything worth preserving in the ethics of Spinoza, we might perhaps discover there the famous aerial bridge of the magic hair supposed to span the gulf between the mathematics of the absolute and relative observation of phenomena. So bold is the 'integral' thinker that he resolutely commits himself to it. But the first question is to know whether purely abstract reasoning can overtake, and even go beyond, experiment. Is it possible that the human mind will be fortunate enough to arrive by two different paths at two different aspects of the same 'truths'? [1] After

[1] Metaphysics would thus become something in the nature of an absolute method of calculating possibilities. In that sense we could go so far as to say that metaphysics, theology, and even science are methods of calculating probabilities, the chances of which vary with the growth of our knowledge which puts each historic school in its proper place, as verifications may determine. Every one knows that by taking the twenty-four letters of the Greek alphabet and drawing them by lot often enough, we can succeed in getting the *Iliad*. It is simpler to let Homer do the task. Nevertheless, that theory opens a vista upon the profundities of existence. If everything is possible in the cosmic

all, nothing that comes from the unfathomable gulf can astonish us!

According as morality is or is not put under divine sanction, it sees the foundations of its doctrine change; and yet empirical social relations do not cease to impose the same necessities. Where shall we place the sanction? 'If God and the universality of existences are the same thing, God, being all things, is nothing in particular. . . . If God is the necessary and infinite being, his consequences are infinite. How is it possible that limited and finite beings should have consequences?' [1] Furthermore, 'if personality is not consistent with absolute being, it is excluded by infinity.' [2] As soon as we determine that the Ego is only an organic complex, if we wish through it to reach the absolute unity of the divine Ego, all we need do is to find the limits of the illimitable. But should we fail, would the contingencies of human life be changed?

The task is to sew together again what has been cut apart. The Spinozan operation cut away the dead from the living; and since the living, which is man, cannot disappear, it is inevitable that as the result of experience man should maintain the moral norm which supports the whole growth of his life. After all, the soul and its activities are at best only temporary explanations. No one has yet been able to separate himself from his organic foundation. Long before the problems were attacked in any doctrinal way, the whole apparatus of empty words had already fallen and been swept by the impetuous flood of accumulated knowledge into the sea of things outworn.

The mere statement of ethical hypotheses is sufficient to indicate how far the scientific knowledge acquired by and now familiar to the modern mind has gone toward upsetting our methods of conceiving and developing relative truth.

lottery of endless numbers, we should obviously find ourselves 'explained' by the same 'reason' that explains every possible event.

[1] Boulainvillers: *Refutation of Spinoza*. See his translation of the *Ethics*, with its able preface by F. Colonna of Istria.

[2] Preface.

Although the tunnel of investigation may plunge into darkness, it may yet encounter a beam of sunshine, and, like the Titan of the Caucasus, strike a spark from the clash of two darknesses.[1] The great polisher of mental spectacles knew so well how to smooth his lenses that he voluntarily gave himself up to a mathematics of words, and he saw, and made plain to others, that by way of an equitable compensation, the strict logic of the despotic word led only to the disappearance of everything not scientifically proved. The man who imperturbably dared to carry out such an enterprise rendered as great a service as did the most successful conquerors of relative knowledge, for with his evocative phosphene he lighted up some part of the black screen of the absolute.

There is no effect without a cause; no cause without its determining cause. That formula must be applied to the universe as well in its infinity as in each of its scattered *quanta*. Does the moral law, which is universal in its doctrine because the organic conditions of social man determine all its lines, come from an indefinable absolute or, like all other laws, does it simply express a sequence of relations which is convenient to use as a foundation? On this assumption, we may from now on regard the problem of positivity as solved. Since metaphysics ended by eliminating completely and permanently from the absolute every trace of personality, have we the choice of seeking our own law elsewhere than in the coördinations of scientifically determined phenomena?

Didacticism, with its 'principles' of morality as metaphysically taught, is but vanity. Do we teach children to stand on their feet by explaining to them the biological principles that underlie the act of walking? A child very soon learns that if he lies or if he pilfers he will get into some sort of trouble. Falsehood and theft seem to him useful, and his own personal intelligence has no objection to them. Sometimes he is deterred by the commonplace sanction that is the foundation of his moral apprenticeship —

[1] The *Arani*.

namely, his chance of being caught. The ultimate value of our social sanctions which the child disregards consists in their being settled with a view to permanent efficiency.

What a series of related moral states exists between the child and the old man and between the savage and the civilized man! Through time and space we find temporary standards of morality, gradually advancing, each in its own fashion according to the inevitable combinations of knowledge and feeling. The famous witticism, 'what is justice here is injustice there'—means just that. It might be surprising to know what variegated rainbows of good and evil might be found in the depths of consciences upset by shifting emotion and thought that give a special color to any avowal.

To preserve the proper attitude toward all rights to existence, toward all sensibilities, among the twists and turns of all our commingled activities is an undertaking that stops dead at the antinomy of the eater and the eaten. Life is sustained only at the expense of other lives. God decreed that evil to an extent surpassing comprehension and now ironically bids us turn it to good ends, in default of which he aggravates the worst fate by making it eternal. What a sanction of 'supreme justice and love' theology gravely offers us as a sequel to its stakes of martyrdom!

Although Greece and Rome disregarded that sanction, they nevertheless produced the finest specimens of the human species. Guyau argues for an evolution of our minds toward an attempt at a 'morality without sanctions'; that is, with the single sanction of man's judgment of himself. The idea would have seriously shocked our primitive ancestors, who after the example of their animal forbears measured the value of actions only in terms of resulting satisfaction or suffering. Fundamentally we have not changed, for our still rudimentary social organization can hit on nothing better than to flank the law on either side with rewards and penalties. Based on the unalterable foundation of self-interest, reward and punishment, whether of God or of man, are shafts from the same bow, whether aimed at one extreme of our sensibility or at the other.

I say nothing of the 'exemplary' punishments or rewards that produce the exactly contrary effect from the one intended, since they end in the everlasting spectacle of self-interest satisfied or curbed. Conferring so-called honor or imposing a punishment emphasizes the attraction of influence and of favors, that is, of injustice, with the added annoyance of an inability sufficiently to control them. It is a lesson in balancing the moral scales wholly different from the one on which we lay so much stress. And as to divine recompenses and punishments, let no one tell me that the Almighty shows no partiality, since our sub-divinities — from the Virgin Mother down to the Saints, sustained by a priesthood whose sole activity it is — have no other function on earth than to exert influence to bring about favoritism, as happens among men, in the final distribution of the pleasures and pains of eternity. In that sense prayer is an insult to the absolute justice of Divinity.

Must we, then, conclude that the moral progress of man is pure vanity? I am very far from claiming any such thing. All our histories at least make us realize the increase in scientific knowledge, which, in spite of many emotional detours, should slowly produce an improvement in morals. Any one can see, however, that the two cycles — of knowledge and morality — are not of the same radius, and that mental evolution (already overdue) and moral evolution (which often requires the most difficult readjustment of our energy) do not keep step. Since we must first decide to what ends our organic activity can and should be exercised, our accumulated knowledge is essential to an increase of virtue. But if we claim that our life depends on other things than words, of what use is a mask of pretentious morality to which reality too plainly gives the lie? How obviously in our attempt to dupe others do we begin by duping ourselves! That is the chief obstacle on the arduous path of our earthly errors. Amid the contradictions of our short lives time presses.

Why should we not build our own destinies both on ideals and on facts, since the accident of things has made them our

law? Doubtless, it would be but a fragile accomplishment lasting only the space of a flash of lightning, but great and beautiful nevertheless, because of the quality of the effort. And what would the length of its life matter? What merit would the extent of its manifestation add to it? Dare we, then, regret being men, that is, the quintessence of life; and when we had so much difficulty in becoming human, shall we waste the marvelous gift in regretting that we are not superhuman?

To be sure, from the depths of their wells of knowledge, the astrologers offer us precious sorceries, vestiges of the first mental conceptions that slowly gave place to precise knowledge. Let him who will remain in the ancestral torpor of those paradisiacal fumes for which, perhaps, we shall some day substitute the positive joys and pains of a life of disinterested effort. Nowhere in the universe do we find stability, and on the brevity of this changing existence, a brevity which is the subject of great lamentations, rests the very foundation of our greatness. May we not be something like a climax in the cosmic drama, toward which it may be constantly working up until the final scene? If we can find in such a prospect only a cause for complaint, there always remains the last resource of moral suicide, of plunging back into the gulf of brutish ignorance, as Pascal, when he had reached the limit of his powers, did not fear to suggest.

But no; we ask for all the beauty of life crowned with a complete indifference to death — death so cursed by those who have not known how to live. Death — last leap of human sensation, like that of the diver who from the top of his rock commits himself to the depths that await him; death, the home-stretch in the race toward the elusive ideal, the mystery of which tempts us to undergo all trials! That such is the case the noble martyrs to great causes attest, among whom those who expected no reward in the hereafter shine with purest light.

In indeterminate space and time, I am satisfied to accept the relativities of the hours of which it is my fate in part to

shape. Of the real end of the ideal I ask my full share, and should I have the chance, I would gladly accept more at the price of renewed effort. And like the laborer at the end of his day, the more I had given of myself, the more should I value my well-earned right to a long night's rest.

EMPIRICAL MORALITY

We know only too well to what the religious nostrums of the morality of which the priesthood pretends to be the sole depository reduce themselves. Although our theologians may claim a monopoly, they must admit that without the help of the gods, the peoples of Asia, the Greeks, and the Romans, as well as ourselves, have supplied just as fine models of the highest virtues as have we — models of the very virtues of which the pontiffs of religion claim the exclusive ownership on behalf of their own flock. It is generally conceded that India and Greece produced the noblest specimens of human greatness (Buddha, Socrates, and many others were no whit inferior to Jesus) as results of a morality the teaching of which was entrusted to poets and philosophers unhampered by any intervention of Divinity. As a matter of dogma, Socrates will surely be damned for the crime of not having been a Christian before the time of Christ, in spite of the fact that Christ never said anything which could be so interpreted.[1] The teaching of the Church, blamed for so much criminal violence, admits no 'morality' outside an antiquated dogma,[2] the sanction of which is en-

[1] The Church is so embarrassed in this matter of dogma that some so-called authorities say, *sotto voce*, that Socrates may after all be in Paradise. That is like the epigram of a certain eccentric parish priest: 'God is so good that there is no one in hell.' No one could mock his own 'faith' in pleasanter terms. If Christ came to redeem by his death those who believe in him, it necessarily follows that those who for any reason whatever have not believed in him are not redeemed.

[2] Man, according to fossils, is an incalculable number of centuries old. How shall we explain God's waiting so long to reveal his paltry 'truth' to mankind, and thus condemning unnumbered multitudes of innocent creatures to his pitiless and everlasting damnation? In such a mess Pithecanthropus, since from his lack of development he was not human, alone has a chance of getting clear. But how about the man of Chapelle-aux-Saints? No one ventures to tell us.

trusted to the hands of a 'good' God who needlessly created evil.

In truth, gods and demons are all one — since good and evil (that we turn into active personalities) are nothing but our own subjective states. All gods, benevolent or malevolent, result from the same failure to analyze the facts. A good god was not obliged to create evil spirits any more than he was obliged to create the evil they perpetrated in the name of his divine charity. Our devil, endowed with elements of divinity, *by permission from on high* too often prevails over the God of love, who unwillingly finds himself the author of evil — a circumstance that does not inspire in us any great respect for his sovereignty. Apparently he has only an uncertain refuge of everlasting felicity to offer us as compensation. Furthermore, whereas the Creator has never revealed to us the nature of that felicity, and whereas the offered compensation consists only of promises that are to be kept no one knows how, evil on this earth is made plain by effects of a too certain and too patent reality.

The precepts of the Evangelists are much superior to the purely negative Commandments of the Old Testament. Can any one, whether or no a believer, not glory in claiming them as a part of his own doctrine? Everywhere their formulæ are constantly and insistently urged upon us. Can any one repudiate them? The man who disregards them most still hides behind them. Meanwhile, how much do we heed the primitive prohibitory precepts? Read the newspapers; they will answer the question.

Proverbially, 'Wolves do not eat one another.' In that case, the saying of Hobbes, *Homo hominis lupus*, flatters us, since among man's occupations the principal one is even to-day mutual slaughter. To be sure, wolves show no sign of having *precepts*, and thus they apparently lack the consolation that comes from disguising the cruelty of their actions under the sumptuous dress of a universally proclaimed benevolence.

I shall continue to emphasize the distance which separates

morality that is spoken from morality that is lived. Max Müller, vigilant follower of the one and only God of Great Britain, so far forgot himself as to tell us of the disappointment of a pious Hindu who carelessly permitted himself to be converted to the Gospel of Christ. Thanks to conversations with missionaries and to his own reading, the excellent man in his inmost heart painted for himself a dazzling picture of the active morality that a Christian country should present. He set sail expressly to have the happy sight of that most edifying spectacle. He arrived, all eyes. He looked; he listened; he asked questions, ready to be wonder-struck. Imagine his stupefaction! Everything was as it was everywhere else. The men whom he saw before him were neither better nor worse than other men. The precepts were excellent — as were those of Benares. But in England no more than elsewhere did they seem to govern conduct. In despair the unfortunate traveler began to talk of being reconverted. Brahma, Vishnu, and Siva were preparing to celebrate his return to the fold when an attentive reading of the Bible, we are informed, turned him away from that project. I wish some one would tell me where he should have gone to witness the great miracle of a perfect harmony between speech and action!

On the authority of their preachers, Christians go about claiming for their theology the exclusive glory of the excellent principle that we should love one another, and not do to others what we should not want them to do to us. That lofty enunciation of morality, although it does not occur in the Bible, is proved to have existed in the most remote ages. The Athenians traced to the hero Bouzyges, that is, to the earliest times, the precept: 'Do to others what you would have done to yourself.' And later, Isocrates thus expressed the same idea: 'Do not to others what you would not suffer from them'; and again: 'Be to others what you would wish them to be to you.'

Buddha, Lao Tsze, and Confucius [1] said the same thing

[1] Confucius: 'What I do not wish men to do to me, I likewise wish not to do to other men.'

twenty-five centuries ago. Buddha,[1] the Indian Christ, but without a Golgotha, preached a vast human pity, and the love of your neighbor. Confucius with his rationalism and Lao Tsze with his Asiatic detachment from the material world had an ardent desire to lead humanity along the Tao, that is, 'the straight path.' Could one find a better example of mutual aid? Is not the most vulgar almsgiving, regardless of its form, the only practical expression of pity for your neighbor? If man dared oftener commit himself to that policy, what unexpected joys, what personal benefit, would accrue to him!

No one has asserted more loudly than the Chinese the necessity of loving others. 'Whence comes all trouble?' asks Mei-ti. 'From our not trying to love one another.' Whether the word 'Chou' be translated as 'love your neighbor as yourself' or as 'judge others according to the standard you use in judging yourself,' the underlying sentiment is the same. Do not the Tao of the Chinese and the Shinto of the Japanese make identical recommendations on this point? Has any one ever proposed a religion based on hate of your neighbor? *Caritas generis humani* — such is man's impulse, with or without gods. All human beings *say* the same. Alas! when it comes to practicing their ideas, they agree only too well in following the path of least resistance. Nero never asserted that it is good to murder your mother. He contented himself with being a deliberate matricide. Nevertheless, he found 'wise men' to praise his act.

I gladly give the credit due our churches for preaching the lessons of love common to every age, but it is on the actual results that we should fix our attention. Could the results be clearer? The 'followers' of Christ have not only rushed, sword in hand, on all those who did not accept their faith, but have ferociously massacred their co-religionists in the name of their own religion of love and under the very ban-

[1] The comparison compels me to notice that Sakya Muni had a theory of the universe, and one, moreover, which was strikingly comprehensive, and that Christ says not a word which can be interpreted as meaning anything of the sort. He had no general view of the living world.

ners of him who had expressly bidden them love one another.

Over disagreements as to the proper interpretations of words, heresies without number were drowned in blood. Even in the name of evangelic love, the worst brutalities were committed to prevent man from loving his neighbor in ways other than those sanctioned by our 'infallible' priesthood. Among Christians religious wars [1] have arisen and spread; wars that gloried in the devastation of countries and in organized murder. If you have any doubt, read Montluc. The fires of the Inquisition made the flames of Nero's torches made of Christians look pale. Was it not in the name of their Church that the Conquistadores plunged South America into a horror of destruction, of wholesale massacre, of unspeakable torture? Not until the beginning of the nineteenth century did the pressure of philosophy put an end to the *autos-da-fé*. What a confession it is ingenuously to call a torturer's delirium an 'act of faith'!

THE 'FAILURE' OF HEAVEN

In this stupendous failure of the Christian attempt to translate Christian teaching into conduct, before the eyes of the helpless Galilean, and while the priesthood applauded, some degenerate literati have delighted in the buffoonery of proclaiming a 'failure of science'; that is, of knowledge based on observation. And on such evidence as theirs the Church claims that it alone is able to supply the sanctions needed to make a moral doctrine operative! Those sanctions consist of the vague paradise of primitive humanity and the contrasting horrors of an infernal region, together with the Hindu theory of an intervening purgatory intended to enhance the value of 'indulgences' aimed at soothing desperate souls with hope. Any moment of history will suffice to show their efficacy. 'For the struggle of life two things are needed, weapons and courage. Science promised us weapons; it has given them to us. If we have not the courage to use them, it is not science that has failed, it is we.' [2]

[1] Could two words present a greater contrast?

[2] Henri Poincaré.

The fact is, the extent of knowledge, although not importing a perfectly corresponding degree of morality, as the example of Bacon makes clear, nevertheless opens many of those doors to the general development of ideas of equity and of personal disinterestedness in which the dignity of man makes itself manifest under the name of 'virtue.' Ignorance and the atavistic misconceptions of rudimentary ages were not a happy background for displays of grandeur of soul, which requires a refined order of intelligence as well as of sensibility. We can never gain too much knowledge if we are to do right, or even if we are simply to try to do better.

Not that the lure of recompense and the fear of chastisement have not their weight in the lower ranges of human consciousness. But may not the problem be, instead of making our whole conduct dependent on them, progressively to detach ourselves from them, as is implied in the idea that self-sacrifice contains in itself the finest reward? Thus one might be able to assign to its proper place in the scale of human feelings the fortunate or unfortunate outcome of an act prompted primarily by noble motives. As the sanctions which the Church claims the sole right to dispense are made to appear even to-day, they represent nothing more than a very fairly low stage of primitive morality, which is far from favoring the evolutionary effort toward a greater self-abnegation. It is unnecessary to add that the culture of our time can no longer see in them anything but a shapeless vestige of primitive fables; of which the enlightened man of to-day cannot speak without smiling. A good number of our contemporaries have already begun to comprehend that for a lofty soul the purest recompense is to feel itself above recompense, and that the surest punishment for failure in duty is the increase in the number of backsliders, who might end by dragging man below the level of the animals.

'Human happiness and greatness,' writes Renan, 'have until now rested on a false foundation.' How could it be otherwise, since we began in ignorance, and since it was actual progress even to attain misunderstanding, the first

step toward that least possible misconception which we call truth? We are much less to blame for that 'false foundation' itself, which at the start was inevitable, than for our childish acceptance of it in the face of observed facts — in order to follow the path of least resistance. If there ever was a revelation, why was it not complete and definitive, and of a sort to make us both good and enlightened? Revelation with its puerile theatricalities gives us a picture of the Almighty forever obliged to begin anew, forever forced to correct his own mistakes in order to escape the cross-fire of human experience — which will always have the last word in the debate. Renan's 'false foundation' consists simply in the fact that the 'divine' [1] appeared on the earth through the act of its own human creator.

Without man, moreover, of what use are gods, since from our point of view they never serve any but human purposes? What can have been the history of Eternal God before Genesis? Jahveh told Moses nothing of that history — and for excellent reasons. If he had not proceeded to the act of 'Creation,' what an existence would have been his — able to do everything, but accomplishing nothing! Had he perhaps made a previous attempt before creating this earth? If not, what did occupy him throughout the preceding eternity? Why did he give himself so much trouble about this imperceptible globe, when the fields of immensity were on all sides open to him? Should the human race disappear, what would become of the enterprise of the Creator? Should we hope that in his distress the idea of beginning over again would not occur to him? Remember his mistakes as recorded in Holy Scripture! The drama lies in the obvious need of a supreme manifestation on the part of both protagonists — a god incomprehensible because made to the measure of the man of former days and modern man, too enlightened to risk making for himself a new divinity.

[1] In Renan's case the contradiction lies between the admirably courageous act that led him to abandon faith for knowledge and the failure of that act to make him brave enough to change his phraseology. How significant it is when so lofty a mind succeeds in mastering ideas yet fails in mastering words!

Absolute god must remain unimproved; relative man must change. We have animated our human-faced gods with our breath in order to yield ourselves to their caprice, to receive from them good and evil, and to spend our lives in constant supplication, instead of in devoting ourselves to our allotted task of studying facts. These gods we have called eternal, but it was not in our power to make them so. Since they are flesh of our flesh, we have found them, along with their train of myths, which history shows us are brittle and uncertain, transitory like ourselves. Groping humanity follows them from their birth in the dazzling brightness of the sun (glory of the first religions), to their fall in the everlasting night — a night far less black for us, who are playthings of the elements, than for the old omnipotent divinities, who unmistakably were left with no hope of a future. Between Golgotha and the Sacré-Cœur and Lourdes, see into what a state our mythology has fallen! The last vestiges of the gods of Plato, of Philo, of Plotinus, of Spinoza himself, as foggy as the profoundest depths of Nirvana, last echo of sonorous words, leaving nothing behind but a heel in the bottom of the crucible, will perhaps figure some day in the showcases of the museums of metaphysics.

LAWS

Now that the gods have vanished without leaving behind them any other *caput mortuum* than the illusory echo of a dream, how shall we conceive the universe? We have reached the point of thus putting the problem to ourselves. But each one of us is fully aware what expenditure of energy was needed in the course of the ages to get replies to the questions that arose from what man's observation encountered. In the primitive cosmogonies, which recoiled from no aberration of fancy, we find the best information concerning the first systems of imaginative interpretation. Creations, emanations, successive acts of will are the ordinary manifestations of Powers, dating back to the 'Eternal Principle,' which in the sacred books of India sometimes seems to have escaped the belittlement of personification.

Such are the Vedic Atman, and Brahman, of whom no one knows anything, except what he was *not*; such is the 'word' of Saint John in which no doubt the Holy Ghost originated.

Primitive imaginings mingled with the original outpourings of thought before they clashed. The masses, greedy for formulæ, regardless of the quality, could not avoid being caught by the puerile lure of superhuman wills, which in the course of ages wore out, and, like radium, were dissipated exclusively through the effect of their own activity. Metaphysics itself, born of the need of superior comprehension, could only postpone the end. The day had to come when the mistakes of the first ages should disappear in the light of maturity.

The thing that is perhaps most remarkable in the confusion of imaginative misconceptions is that imagination itself, always seeking to surpass itself, happened to succeed and to hit on ultimate formulæ of generalization that made us formally declare the impersonality of the energies that we had rashly personified. Such is the impression made by numerous hymns of the Vedas, from which our pantheism sprang. For a long while yet men were to fight over the myths or even over the lucubrations of metaphysics. For a mere difference of shibboleths, heroes marched to torture, and the posterity of the Christian martyrs found satisfaction in the trade of the executioner.

Because through endless centuries imagination remained beyond the control of science, it could freely go to the limit of its flight, and nothing was able to bring it back to earth. Thus it had to 'keep the air' as long as it could, with the obligation of sometimes 'taking ground,' like Antæus, in order to renew its energy. However, the strongest of fictitious Powers can have no more than their day. Through all the relativities of a personification to which too vivid characteristics had been assigned, the myths ultimately reached the limit of man's capacity for blind acceptance. They met with an indifference more cruel than death and sometimes hardly saved themselves from being forgotten altogether. In spite of mechanical lip-worship, slower to disappear than

the myths themselves, that whole imaginary world vanished through a wearing-out of the springs which gave it a semblance of life. What would have been man's future if among so many clashes he had not encountered brief sensorial experiences, made fruitful by hypothetical explanations, whereby imagination itself ultimately learned to rule and check its own disorderly impulses?

I do not know, and probably no one will ever know, through what trials the metaphysical imagination of India had passed before it recorded in its sacred books the fact that Brahma himself no longer sufficed as a supreme principle, and that, in following the logical interlocking of causes, it had found above the gods themselves an immanent energy,[1] of which the god who had made the world was no more than an emanation, whereas, free of all organic individuality, that very energy dominated the universe and its gods. The impersonal Brahman thus contains god the creator, an emanation whose very personality seems to make him much too human. And in the sacred hymns we can note those first stirrings of doubt through which the power of imagination, with no counterweight of experiment, found itself self-arrested. 'Who has made all this? . . . And thou, who hast made it, how didst thou make it? Dost thou know?' Those are terrible questions, which theology has prudently evaded. What clearer indication of a stage of investigation no longer in accord with the fiction of personified Powers could be found? Science proved that view. After a flight unguided by any compass imagination voluntarily returned to its starting-point.

The same is true in the no less vast field of philosophy. It was not experimental science that first carried the analysis of the world to the ultimate of the atom. The word 'atom,' anticipating the scientific fact, is an example of the scientific hypothesis in its most perfect form; that is, a conjec-

[1] In the distinction between the metaphysics of energy and the metaphysics of matter I can see only a verbal statement of two different reactions of my subjective self in contact with universal cosmic activity. I prefer the formula, energy-matter, in which I sum up my ultimate generalization.

ture of the imagination as yet wholly unsupported by any experiment.[1] Democritus, Leucippus, Epicurus, Lucretius, never say that they have *seen* the atom. They prophesy it. A series of verified experiments has recently forced it on us, who at first accepted it for lack of something better.

Are we satisfied to go no farther than Lucretius, the Roman heir to Greek thought, whose bold effort consisted in stating an hypothesis of the positive structure of the Cosmos, based not only on contemporary but on anticipated observation? Is a poem, however beautiful, enough to govern us? How different it is from the rigors of the experimental method! How many centuries were to elapse before the word 'method' could attain its modern significance! Inductions and deductions of all kinds followed. At that time the one apparent tie between various phenomena was logic; and of what use is mere logic; that is, an attempt to discover the system of things with no recourse to constantly retested observation?

Well, the Cosmos which the poet who anticipated observation offers us is an incomparable scientific effort, superior to that of Manu, to that of Moses, and to those of all other generalizers of apparently established facts. As rigorous scientific observation was still unknown, man had to be content with coördinating by means of the guide-posts of imperfect experiment series of facts which led him to explanatory hypotheses. That accounts for our faculty of dreaming, which anticipated positive knowledge of coördinated science solely through the power of the automatic efforts of imagination. Thus the use of words, essential to the strict, logical arrangement of thought, recognized its own inadequacy by spontaneously taking its course from the fixed star of observation.

By such channels, through which flowed the highest emotional energy of the human race, after the period of the first experimental classifications, opinions came to take

[1] We meet the atom in Manu and in Sankara (of the Vedanta), who with Kapila (of the Samkya) is the founder of the pantheistic metaphysics from which Buddha drew his teachings.

logical form, ranging from our personified abstractions to that *depersonalizing* of energy through which the problem of a cosmic synthesis of all objective reality was finally evolved.

Here our concern is with accomplished facts. The depersonalizing of the impersonal, which had been fictitiously personified, followed its course step by step, and the ancient Decrees of Heaven gave way to the Laws of Science. The difference was of great importance, since the greatest human battles have been fought over those two themes, and since many persons of mediocre mentality still suffer agonies of apprehension at the mere thought of any other outcome of the struggle than a justification of the hereditary beliefs that are part of their mental habit.

The capital difference is that the 'Decrees of Heaven' and the 'Divine Will' [1] can seem to us nothing but an incomprehensibly intricate and elusive thing, the course of which we try to alter by prayers that are supposed to have the effect of moving the 'immovable.' Flaubert genially remarks: 'Crime is always punished — and virtue also.' Good fortune is our recompense, misfortune our punishment, subject to the chance of being reversed by a Providence that alleges a desire to 'prove' us when its lightnings fall inopportunely. Thanks to that ingenuous artifice, the Almighty is never wrong, whatever happens.

We must choose between these two conceptions of the world: government by a Sovereign Goodness, which unintentionally does evil, and whose decisions our interested prayers can change, or by a sovereignty of the unchangeable coördinations that constitute 'the rules, the immutable laws' of phenomena. We must choose between the adaptation of the world to human ends by the effect of a divine will the guiding principles of which we do not understand and the adaptation of man to the world through the agency of a fragmentary knowledge capable of controlling for his

[1] Is it necessary to observe that a will without an organ cannot at present have any sense in our eyes, and that the idea of a cosmic organism is incompatible with the conception of infinity?

convenience the action of relations that he accurately understands. We must choose between sovereign caprice, before which we must abase ourselves, and stable relations that knowledge permits us to utilize. *Haud imperatur naturae nisi parendo* — which amounts to saying that through particular combinations of relationships we can infallibly get foreseen effects, whereas if we put our trust in prayer, we cannot possibly rely on the results. We build a locomotive with hammers, not with supplicatory rites.

The theory that the world is governed, not by arbitrary will, but by universal law — such is the positive gain that scientific knowledge has brought us. The incalculable sum of age-long effort, the reward of which is our conception of cosmic law, acts against the ingenuous primitive imaginings in which our dogmatic sorceries still struggle to hold us as in a gloomy prison. Which, then, should prevail — the slow evolution of progressive intellectual power, having its source in our organic life (the actual development of which we represent), or I know not what tetanic contraction of ignorance, of human deterioration into brutishness,[1] that would bar the path to the achievements of knowledge — cursed under the name of science — in order to bring us back to our original errors? To progress or to regress — in the ineluctable terms of phenomenology, that is the problem.

It is not to be inferred that we may not hope in time to surmount the *immobile saxum* of locked minds. Capable of yielding to the testimony of phenomena, they should in the course of ages give up their automatic fixity of opinion. I shall drive no hard bargain as to the number of centuries — mere drops in the ocean of ages — which may be required for them to gain new infiltrations of light in the obscure tunnel where, all together, we are proud to be excavating.

[1] I do not hesitate to make use of the word, since it is the one that Pascal boldly seized upon for the supreme effort of his demonstration. Such a mind as his would hardly trouble itself about possible contingencies. He required no less than absolute truth, even though it told against him. Let us salute one of the noblest despairs in human history, the dramatic sufferings of which were, it seems, unable to conquer the unyielding torment of an obstinate doubt.

After Flaubert's Saint Anthony had been successively exhausted by his wandering dreams, he speaks these terrible words: 'And now, let us begin anew.' What other result could follow, since the Decrees of Heaven have this marvelous property: man — in whose interest they have been foreseen from all eternity — can escape them through the agency of rites followed by the appropriate supplications? Immutable they are, yet susceptible of change: let each one reconcile that contradiction to suit himself! Some one has said that no one prays that two and two shall make five. We take the chance, however, of hoping to modify the apparently less obstinate combinations of cosmic action — mechanical, physical, chemical, biological — the phenomena of which are complicated beyond the reach of the 'insight' of the vulgar. We pray for the ending or the coming of rain, or that the lightning shall strike elsewhere than is prescribed by its own laws. We perform acts of gratitude to the Divinity if the prayers are granted; and acts of gratitude even if present satisfaction is denied us — for our ulterior good, as we force ourselves to suppose. In doing so we think we run no risk of being disappointed.

Among organic beings of all degrees of complexity prayer daily gives itself full scope, and it is inconceivable that the time will ever come when the practice will be abandoned. The maladies of cattle and of human beings, accidents of all sorts, ever-pressing needs, incapacity, lack of foresight, and disappointments of every kind open to the vagaries of imagination a limitless field for prayer to the Unknown.

The teachings of cosmic law require of us a completely opposite frame of mind. Imperfectly recognized, yet sufficiently so for the security of our relative knowledge, that law can be invoked only by means of facts learned from experience. Pericles, explaining an eclipse to his affrighted soldiery, marks a decisive hour in the history of the human mind. It was the spot where crossed the two paths between which Hercules boldly made his choice.

Laws are statements of observed relations; that is, of

the constancy of relations in the activities of the universe which little by little we have been able to recognize. These consecutive and constant relations are all that we know of the world. They are temporary guide-posts arranged along explanatory lines. They are the 'unwritten laws' which, Antigone argued to Creon, constitute the supreme law of universal government, against which nothing can prevail. They show the complete contrast between a world impassively systematized and one governed by the abrupt and disconnected impulses of a divine will, like that to which we are invited from the high pulpit to pray. What would happen to us if all our prayers, whether contradictory or not, were suddenly and magically granted? We should have a government of the universe, not by Divinity, but by man — something like a cosmic democracy gone mad. Prayer and law too obviously contradict each other. Since the gods have vacillating wills, as the theory of mediation by the faithful implies, they cannot represent any continuity of relations. The continuity of the world presupposes relations inflexibly connected, the constancy of which is formulated in a supreme law of the universe.

Æschylus with characteristic boldness set Fate above Zeus himself. What can Fate be, if not the sum total of those relations which rule the universe? When the gods shall have fallen into everlasting oblivion, it will be the inflexible Law that has pronounced sentence. Hellenism personified Law in Themis (Justice), and ultimately identified her with the Earth, fecund mother of phenomena effected by the sun, and, therefore, our lawgiver.

The first calculations of astral movements toward which the course of the sun first impelled us led to the primitive rough sketch of a world-order based on fact and proved to be correct through its enabling us to foresee events. At that moment began the great duel between experience, as embodied in observed fact, and the interpretation of the divine wishes, that finally reached its climax in the trial of Galileo. Since then the field of knowledge has been immeasurably enlarged in every province; to-day we find ourselves

in a position to present a certified balance-sheet of facts which assures the imminent 'failure' of explanations based on the divine. The imperfect state of our scientific formulæ, which are but provisional generalizations ready to give way at any moment to generalizations that are more comprehensive, is the surest guaranty of a necessary harmony between the progress of human knowledge and the progressive adaptation to it of the future knowledge which will result therefrom.

I shall not take the risk of affirming that laws are an 'explanation,' for they amount only to a recognition of the fact that phenomena are successive; that is, that there is a progressive unfolding of phenomena which nothing can stop. We must always proceed from an antecedent to a consequent, for that necessity is the most clearly established truth which we have been able to attain. As to the explanation of the universe, I see no trace of any such thing unless it be in the mysteries of 'revelation,' and those the most elementary observation annihilates.

The universe is. That must suffice for the flash which is our life. Our 'law' triumphantly defines the mode of government of that which is. That is all that our relative abilities permit us to grasp of the universe. It is obvious that in the eyes of the masses hypnotized by 'revelation,' our *scientific law* is open to the objection that it is not a 'miracle' in the childish sense in which we understand the word. From a higher point of view, that fact may well be the marvel of marvels. Certainly it supplies a subject for meditation quite different from the sacred Tables of the Law, given to Moses on Sinai by Jahveh himself as a testimonial of his love for a people who at that very moment were prostrating themselves in religious adoration at the feet of a golden calf. What in those Tables of the Law was so precious that the Eternal himself took the trouble to bring them to the people who denied him? They were the regulations of a village squire, with which Jahveh might well have supplied our first parents when he placed them among the pitfalls of his notorious garden. Could the Master of the World do no-

thing better for us? Apparently not. There is not a word of any revelation of the 'nature of things.' Of man and the world, nothing. It is really too far a cry from Sinai to the laboratory of Sir Ernest Rutherford or to that of Jean Perrin. Is not pretending to assign to the world a reason for existence independent of itself the same as imposing on it in advance a problem put in such a way that the solution is implicit in it? God is no more explicable than the universe itself. He is because he is. That is all the explanation he has been able to give of himself. And the universe in its turn can be content with it.

When we invoke the 'Law,' our theology is careful to point out that we must see in it the manifestation of that divine will which rules the world and of all within it. That helps but little, since we can know nothing except relative relationships, and since in any case we always come back simply to the mere fact of existence. Installing a divine will in the Cosmos has no other effect than to push back the postulate from point to point until we meet the universal phenomenon, namely, the single fact of existence.

Our 'laws' have, and can have, no mystical character. To acquire a knowledge of them we need take nothing whatever on faith. They are the direct and universal result of all the work of all of us — always subjected to every verification and for that reason always worthy of a rational faith. Nowhere do we find them written down, but everywhere from the invisible stars to the inexplicable electron are they made manifest. Is not that enough? And since they tell us nothing except that for the moment relations are constant, those persons who announce their 'failure' are plainly imposing on themselves the duty of making scientific corrections which will establish new discoveries in the field of the interrelation of scientific knowledge.

Our 'laws' are a part of our subjectivity in the sense that, were man to disappear, the formulæ which make them tangible to us would disappear with him, although the facts which they represent would persist unaltered. The objective sum total contained in the relativities we have classi-

fied represents a moment of things that by means of sensation we have had the good fortune to record. Our 'laws' offer nothing beyond that, but on what they do represent we can base our explanations of the present, of the past, and to some extent of the future. Can any one say as much of the outworn gods whose dogmas continue hourly to crumble under the blows of implacably recurring facts? The deified personages are buried in the twilight of dreams. They shared our ephemeral lives. They constituted the first forward step taken by thinking man, but from the day of their birth they were doomed. On the other hand, the cosmic laws, the human expression of related action, could not help coming to light in the course of our acquisition of knowledge, and consequently became better and better adapted to our future development. Though man declared the gods to be unchangeable, they died because they were the children born of our own transformation. Known or unknown, the laws of the world are stable, because our relative knowledge ceaselessly remodels them on the new forms of our acquired knowledge.

Boutroux has amused himself by asking whether law evolves, and Henri Poincaré has amused himself by replying to him in all gravity. It seems to me that the subject is not susceptible of debate. Our 'laws' express stages of relative knowledge in which progress continually succeeds progress. Their human formulation necessarily follows the elementary advance of our evolution. To ask whether the laws of to-day are the same as they were in the carboniferous age is idiotic, since law has no individual existence, but is summed up in the momentary human act of recording. We notice that relations are constant. We try to explain the fact. To the question what those relations have been and what they will be, I can see no other answer than a question mark. All we can say is that the deductions drawn from geological study make us suppose that in a more or less determinate way the laws were then the same as they are to-day. Our knowledge of the structure of the stars postulates that on our bit of the universe we obey the recognized laws of the

Cosmos — assuming, of course, that new definitions of energy will require new statements of the relations to be recorded. Finally, if there is any absolute law of things, I feel obliged to tell Boutroux that he knows no more about it than I do.

A last question might be whether there is by any chance a law of synthesis in which all other laws end by being reconciled, and which sums them up in an ultimate formula — such, for example, as the impersonal god of pantheism. Such a formula of mathematical exactness might be found, perhaps, in the calculation of probabilities, but should be placidly ignored if you have ahead of you a more pressing bit of work. To be frank, the present orientation of our minds inclines us toward an integral conception of cosmic energy. There will always be room enough on the margin of our knowledge for plenty of x's. We shall never attain to the infinite in any form. The famous speculation concerning the 'degradation of matter' through 'entropy' (which I shall take up later) has betrayed some scientific minds into very serious mistakes. 'The principle of Carnot,' Henri Poincaré tells us, 'shows us that energy — which nothing can destroy — is capable of being dissipated. . . . Everything tends toward death.' Is that 'dissipation' necessarily 'death'? It took a long time to discover that death is merely a transformation of life. Nothing is lost in the world, which is no more than a succession of movements. The hypothesis of an equilibrium reached through 'thermic death' can be supported only by minds too anxious to outstrip knowledge to await the verification of present and future hypotheses. That is a fairly serious mistake, considering that we have all the reaches of eternity before us.

CHAPTER V

DREAMING AND THINKING

DIM LIGHT

If we are to live in the world amid those elemental developments of which the Ego is one, shall we dream about the universe or think about it? How shall we discern that boundary between dreaming and thinking which so affrighted Hamlet?

Dreams are what we term the automatic repercussions of disconnected sensation, whereas thought, or the subjective determination of relationships, presupposes sensations that are normally related by the agency of external events. Why dream, that is, why trust ourselves to the unstable visions of a fictitious universe, when there are facts in the world to be known — above all, facts about man? Since we were not at first in a position to observe, we used our imaginations to satisfy our need of knowing. We had to build up from error what we called knowledge, while waiting for the hour when experiment should bring us established fact, obtained by subjectively classifying objective reality.

In the first stirrings of humanity, how could man discriminate between dreams and thoughts? In the tumultuous activities of a mental organism striving to rise above its animality, no delimitation, no order, was as yet possible. In no way could man obtain any knowledge of phenomena and of their still undiscovered relationships. When we coördinated our sensations in a manner beyond the organic possibilities of the animal, we made our first excursion into the unknown. How could we grasp the problems and the solutions of the future?

The decisive step, it seems, came from an overmastering impulse of uncontrolled imagination that broke the armor of the ancestral chrysalis to try its inexperienced wings in flights that sometimes had and sometimes lacked an object. On that day, in the blind fumbling at something that did

not bear even a resemblance to ordered investigation, the first links of human evolution were welded. The first flight was from the darkness of unconsciousness to the earliest gleam of consciousness on the way to self-realization — a flight still hampered by the weakness that was destined to become the strength of youthful hope, the mirages of which could not bring disappointment until after they had brought encouragement.

At that stage of humanity there could be no question of determining the related contours of the relative and the absolute, of the subjective and the objective, of the fictitious and the real, of error and truth. The absolute — that is, the representation of the incomprehensible — was the first bait offered to our ignorant investigations, dissatisfied with approximate 'knowledge.' The absolute is the simple, and the search for the absolute is nothing but the inevitable consequence of man's tendency to take the path of least resistance. The absolute, which seems precise, but which in fact is incomprehensible, was too much for rudimentary observation and therefore succeeded in gaining the support of minds swamped in the complexities of phenomena.

It took ages for us to accomplish the painful conquest of the idea of relativity. No boundaries existed between sensation and imagination, since the idea of controlling observation by tests did not exist. Such a mental condition borders on the pathological. Men's faculties reacted with varying degrees of inexactness; some men, of impulsive, imaginative minds, thought vaguely; others, of more attentive and reflective minds, sought closer contacts with facts. From the same organic state came two blended developments that (although later they tried to rejoin each other) did not diverge until after they had given the impression of traveling on parallel lines apparently in complete independence of each other.

From that point of view, pure misconception, or the chance application of knowledge to the problem (whether a mistaken or correct explanation resulted), were equally valueless scientifically, although perhaps very valuable for

the future, since the fate of the future lay less in the first uncertain results than in the mental effort itself, which was destined to increase until it dominated everything. What did it matter, then, if the first 'truths' of the ages in which definition began consisted of mistakes to be recognized at some later day? The whole future lay in the enthusiasm for investigation, and in that sense rectifiable error came from the same source and, I dare say, had the same provisional effect as the chance discovery of a fact which could not be identified as such.

I used the word 'rectifiable.' That is the essential qualification, for, if the error had been unrectifiable, we should have had not even the mentality of an animal. We became human beings less through the intrinsic value of any particular moment than through the development of superior mental vigor in the course of unknown and still progressing evolution. That development was man's whole problem. It was the drama of our existence, for our tragic unrest summed itself up in a perpetual struggle between inadequate primitive definitions and the organic urge of mental evolution that our savage forbears, wholly occupied with dreams impossible to the animal, could not as yet distinguish from thought.

No doubt human history will be but an unfinished act in the great adventure, since the time required to bring man and his potentialities to maturity surpasses our powers even of estimation. What confusion ruled before man could enter upon the developments brought about by the labor of scientific comprehension which resulted from the hand-to-hand struggle between human sensibility and the elements of the universe! What proof of a primitive lack of adaptation to mental effort the fossil skulls of our far-off ancestors afford, when we seek to find in them organic conditions capable, under the spur of accumulated sensation, of exciting the vaguest questioning of things, even if at first it caused only a darker obscurity!

Regardless of the form of phenomena, the men of those times could not trouble themselves with analyses. How

could they distinguish the primitive dream based wholly on appearances from proof founded on observation — observation that was to require centuries of doubt before it could be accurately interpreted? At that period, dreaming and thinking were one and the same thing. Of what consequence, then, was the original difference between a purely subjective process of investigation and the objective explanations subsequently sought? Sensation reacts at first through dreams — that is, through incoherent reactions of sensibility in accordance with the law of least resistance — before it arrives at methodical formulæ of thought that produce positive knowledge from controlled observation. We have but the one name for the two psychic states of waking or sleeping dreams, which are analogous but different; one expressing in rhythms of wakefulness the effort of the imagination to go beyond environing realities; the other indicating in the rhythmic lethargy of sleep the morbid repercussion of an organism which is out of gear. The latter is like the useless contraction of muscular cramp or the rotation of a wheel without a governor. Yves Delage was wrong in seeking for a coördination in those vain echoes.[1]

I confine myself here exclusively to the phenomenon of imagination, the scope of which depends on the general development and on the particular culture of individual mentalities. Inevitably, there was a long period of confusion, during which the human mind could only seek to find itself, with but small chance of actually succeeding. The emotional aspirations of those ages, which were but the triumphant makeshifts of ignorance, had the value of inarticulate poetry. They were soon called to account by the laborious prose of experience in the form of scientific classification. In the ages when the human species was still in its primitive form there could have been no reason for checking them. Meanwhile the drama grew complex. The woof of human history consists of the evolution of knowledge in the rigid hold of a matrix of misconception that broke slowly, and that could not suddenly be shaken off.

[1] *Le Rêve.*

We have not yet come to the point of considering the two forms of cerebration which occur in the same intelligence: the quick, impulsive flights of imagination and the slow crawl of tardily appreciated experiment. We began to think in dreams, and for our too hasty desire to attain immediate knowledge we paid the price of falling into the gravest errors. Suddenly to abandon our first 'guide' amounted to clipping the wings of the most vital and finest part of ourselves. The illusion of the blue sky called us, and when Montgolfier let us hope for some compensation for the fall of Icarus, we felt as if we were following up in a scientific manner the ancestral urge of our imagination toward the beyond. The rigors of scientific observation from which in our foolish eagerness we would cut free in turn repelled and lured us. It was the unknown that we wanted. How could we attain to it?

BEFORE THE TRIBUNAL

Meanwhile, the world and man stood face to face, each in turn summoned to the bar of judgment; the world, infinite, eternal, alive with action that we cannot turn to our advantage except by yielding to it; man, meanest molecule of the indescribable whole, originally and always spurred on by an irrepressible impulse toward investigation intended to divert a part of the universal energy to his own uses.

The murmuring crowd, harassed with questioning ignorance, anxious to know whence it came, where it is going, and what to do with itself during its terrestrial journey, reached its inevitable limit before it could find, or except in dreams even glimpse, the solution of enigmas that were beyond the scope of its capacities. Asking less for knowledge than for help, it eagerly accepted dogmatic assertions which easily disposed of doubts that later were to tax to the full the high powers of thought as yet undeveloped. What did the great majority care for an exact comprehension of the tragedy of things if magic religious formulæ could bring to it a ritual peace that satisfied the secret needs of a comfortable weakness?

Did not the great Pascal, deeply distressed by the problem, see himself reduced to suggesting that we take *probabilities* into account, explaining meanwhile that betting on Providence would at worst expose us only to the inconsequential risk of finding ourselves mistaken? To be mistaken about Divinity could be no more than an accident of thought. But were we to be mistaken about ourselves, it would entail far more serious consequences when we were recalled to reality. It is true that it is not much easier to contemplate without terror the cosmic phenomenon of our destiny. Is it, then, astonishing that the mystery of death frightens us more than our too familiar life, even though we can explain its perplexities by tracing them back to those primitive impulses which originally caused them?

Necessity inevitably forces the common herd to act on its ignorance. But if the man dissatisfied with inadequate formulæ of 'knowledge' is harder to satisfy, he is fully as anxious as the common herd promptly to believe that he has discovered what he has been searching for. What could he do with his treasure-trove except communicate it? Either he would make his formula harmonize with the atavistic misconception of popular sentiment, itself thoroughly impregnated with primitive weakness and merely a new adaptation of ignorant dogmas, or he would take a different point of view, and be generally looked upon as an enemy. Such, in varying forms, is what still goes on even to-day.

Although at so early an age there could be no question of man's distinguishing between imagining and observing, the evolution of thought was about to begin. And the determining agent, we must surely admit, was the first man who differed — the admirable 'heretic' whose execrated name simply implies that, instead of blindly conforming, 'he chose his own course.' Whatever he taught, he remains the first hero, the great ancestor of our evolving generations, and his the supreme honor of being treated with no mercy. Alas! he could not know what props of ineluctable experiment were in store for the obscure heroes who were to

follow him. Could those heroes by any happy chance have found some consolation in the pride of their moral solitude? That pride is the finest source of energy for the man who is undergoing the torture of a magnificent doubt.

What is it that so dazzles us about our brief span of life? Why do we close our eyes to the truth as soon as we have opened them? Do we curse the repose of night after the fatigues of the day? Life has its splendors. How dare we complain? And, however laudable may be our ardor to live, not only in the love but in the service of noble causes (the finest images of the greatest dreams), how great are the mercies we receive from the beneficent sleep that cheerfully abridges by half both the pains and the joys of our quick sensibility! Happy is the refuge of welcoming death that ends with nothingness the tedium even of good fortune, only to revivify us in such new forms as unknown energies may decree! Marvelous is the peace of an existence which, like a beautiful storm, sublime in its harmonies, reaches its perfect end over a far-reaching ocean! A great peace of hope; no sooner shattered than renewed.

The eventual, beneficent accord between direct sensation and the mental imagery organically connected with it excites us to action through the lure of a more complete life — in fact, it excites us before we can understand the elements that determine it. How fine is the magic which enables us to associate fiction with the arduous labors of the day, in order to sweeten the unhappy hours with interludes of happy unreality! It is the vision, the splendid, lying vision, winged with casual future truths, which seeks to make life different from what it is, and which in very truth will make it finer if we are only able to shape it. It is a fictitious abolition of what is! It is the marvelous vision of a more 'human' world, instead of one in which bruises are not spared us!

Thus, not content with enlarging the realm of illusion, we shall not rest until we have fixed, according as circumstances may dictate, the elements of fiction in human moulds. Music, dancing, poetry, prose, tales, plays, novels, comedies — all are intended to evoke phantoms which will

carry us beyond the bounds of our destiny. Life cannot free itself from the dream that possesses it.

'I go, living wholly in my starry dream,'[1] cries the hero of a famous drama just before the final catastrophe. Such is the intoxication of our human kind, triumphant in the anticipation of making its vision real, even though it may prove a simple hallucination. The choice is often hard to make.

The inevitable confusion between the dream-shapes and established knowledge is increased because, contained in the organic possibilities of the successive stages of our understanding, they evolve along parallel courses. In order to synthesize the phenomenon, one should, perhaps, discuss the temporary correspondence between the evolution of error and the evolution of truth. But many minds might be led astray. However, the fact is obvious enough that the power of imagination, far from abandoning its hold over the development of humanity, or even from being pushed into the background as exact knowledge increases, continuously draws from the vast unknown new elements of energy for ever-renewed efforts, strong or weak as may happen. When the attempt to think began, dreams seemed at first only to outstrip an intensely idealistic mentality of which the tendency was less to give any strict definition to the unknown than to make an imaginative picture of it, leaving further delimitations to the future.

To cite only the most striking example, is it not obvious that our modern conception of the atom and of its activities, which makes it a link in the evolution of the nebula of which the solar system is a part, started us by its insistence, not only on more precise investigations, but on daring flights of imagination toward a further conception of the identity of matter and energy? Dreams cannot be wholly false, since well-attested observation proves that they have their base in our organs, and that, however fantastic they may be, they consequently have their roots in reality. An hypothesis is a vision which anticipates the day when its

[1] '*Je marche tout vivant dans mon rêve étoilé.*'

useless parts will be replaced by more stable elements of thought. Therefore we should not condemn any of the procedures of our intelligence, attributing to one the fabrication of error and to another the production of experimental truth. To dream is not necessarily to err. Why should we not have now and then a dream that proves true, an hypothesis that, as happened in the case of Newton, justifies itself? But we must appreciate that the rôle of conjecture should become smaller and smaller in verified observation and larger and larger in the activities of a liberated imagination.

If we bear in mind the ease, the spontaneity even, of dreams and the hard labor of knowledge which can be separated from its ore only after successive mistakes, must we not admit that dreaming and thinking are part of the same cogitative process, working under different conditions? We have come to recognize that our classifications of phenomena are purely subjective, and are merely the convenient tools of our intelligence. Since as a matter of fact we discover in the world only relationships among phenomena, it must be that all phenomena are united by identical ties through insensible transitions the stages of which escape our discontinuous sensations. Dreaming and thinking are thus an identical expenditure of the organism, one in boundless space and time, the other within the narrow limits of our senses. By that theory the transition from one to the other through every gradation of the scale is most easily explained.

After all, that simple remark is so close to the evidence that it is hard to see on what ground it can be disputed. The division of mind into 'faculties,' with which didacticism encumbers our psychologies, is one of the great obstacles to simplifying the classification of psychic states. I would not for an instant complain of classification, for it corresponds to a necessary stage of our intelligence. Our classifications are the mothers of mingled knowledge and misconception. To draw from them a clear conception of relations in the successive phases of our comprehension is to compare

their subjective relativity with whatever we can grasp of cosmic action, when experimentally determined.

The first appearance of a sensorial reaction, whether of thought or of feeling, in contact with the exterior world, is so slight as to be closely akin to the original reflex — all the harder to grasp because it is almost indistinguishable from emotion, which is quicker to respond to the spontaneity of the dream than to the labor of determining positive activities. The sensorial reaction classifies as reflexes the first responses of feeling, of intelligence, and of consciousness to contacts with exterior phenomena. And as our senses cannot yet interpret this external phenomenon in any positive fashion, they have recourse to an imaginative explanation, in obedience to the law of least resistance. Thus, since sensation must be linked to organic activity, we note the appearance of those dim subconscious pictures which differ so little from certain dreams originating in the emotions, which are the first gropings after knowledge, and which too often take precedence of the best qualified information. Not that it is impossible to discover the relation between those subconscious pictures and emotional dreams. The truth of to-day may have been the error of yesterday and through the increase of knowledge may become the error of to-morrow. Our states of mind correspond more or less exactly to the objective reality of things, which slowly becomes apparent to us. Thus, from that point of view, we might venture to say that error may be a future truth, and truth a past error. However, we live in part by ignorance, in part by misconception, and in part by knowledge overlapped with conjecture to which we resign ourselves with more or less satisfaction. The function of our intelligence is to set our feet in the path toward knowledge, and we can say that a goodly number of centuries ago that decisive step was taken.

At grips with practical experience, the great religious dreams have progressed from poetic legends to the dry metaphysical writings that have denatured them. Whatever fate awaits us, we are justified in believing that experimental science is established. Doubtless the blind who, in

the words of Scripture itself, are leading the blind are still too many and will long remain so. Alas, after suffocating in the absolute, we have preferred to leap back into the abyss rather than to return to the full light of the sun!

OBVERSE AND REVERSE

Man would not be human were there not two sides to him. We grudge imagination its due. Is it not enough that it exposes us to the danger of overshooting the mark in order to increase our chance of hitting it? And when we come to demand of visions that their original appearance shall remain unchanged so that we may live a life carried out of its orbit by phantasmic error, we appreciate the origin of those successive theologies, whose task it is to govern us according to the deceptive formulæ of the days of man's ignorance. The danger of atavistic dreams, if once let loose, is that they will try to hold us in the fogs of the ages of misconceptions, creators of fictions that no one had the right — or the ability — to test.

One consequence is that our children receive from us, along with the knowledge derived from scientific observation, without which they could not get along, antiquated versions of puerile cosmogonies endowed with the character of supreme authority. Eager for life, they are the less inclined to choose between theology and science, because social discredit lies in wait for him who lets himself be seduced by experimental proof. Thus, our youth learns that there are two irreconcilable 'truths'; one the result of carefully tested observation; the other a dogmatic truth that in contrast to the other pretends to impose itself on us; one, powerful through its continuous offer of free discussion and through the general assent that follows; the other, pretending to dominate the whole man by means of the formulæ of an 'Infallible Revelation,' protected by threats of eternal chastisements. How could such an insoluble contradiction avoid leading to mortal conflicts? Our fate was to destroy one another for the sake of words; and yet, all that was needed to make us agree was that we should recognize estab-

lished facts. But the mob preferred to moan in adoration, with averted eyes, fearing the harsh light fatal to its sickly dream.

And yet, even after such disastrous errors, we cannot disavow our dream without at the same time giving up the highest aspirations of life. What, as a matter of fact, is it that daily brings us nearer to that higher stage of evolution toward which we aspire and in which will occur the intimate meeting between our human consciousness and that universe of which it is the highest manifestation? What is it, then, which, utilizing ideas, was to allow us to struggle forward to the next grade in the evolutionary ascent?

Pascal, attacking the mystery, wondered whether the obsession of a repeated dream might not be the equivalent of a thought that is lived. Would not a king, said he, who on successive nights dreamed that he was an artisan, have a like fortune with the artisan who on successive nights dreamed that he was a king? Charm and terror of the negation of life! Search for an escape in unreality from the obsession of reality!

If observation and vision are actually the result of the same functional activities, though with different results, amidst the ever-varying shocks of the exterior world; if sensations store away only a sum of reverberations that the organism spends according to the exigencies of the moment, we can realize that the phenomenon might be continued through differing revivals of associated sensations. If an excess of imaginative power checkmated, as it still checkmates, the doubtful stirrings of confused experience, we can easily understand that, in the complexities of an Ego the apparent fixity of which consists only in continuous change, a balance would eventually be established between dream and thought. Pascal's disconcerting question seems to me, therefore, very close to tautology. Being a dream-king or a dream-artisan during a half of life and an actual artisan or an actual king during the other half — to determine the profit and loss of such a division, it would be necessary to make out a comparative schedule of differently con-

stituted sensations. Since the sensation created by the dream was nothing but an echo, the sensation given by reality was probably more vivid. On the other hand, the sensation given by the dream might be the finer, because of the ideal harmony which imagination can command. That consideration in no wise alters the problem. Whatever separates dreams from thoughts, harmonious repercussions are set up among all the vital sensibilities, and the conclusion of the whole matter is always a balance of more or less fortunately regulated forces. Enough of vain complaints! To action! To the action of feeling, to the action of knowing, to the action of comprehending through the joint aid of thinking and of dreaming!

Whether I dream sleeping or waking, the phenomenon has the same characteristics. The same unequal contests ensue when the process of imagination collides with the process of definite sensation. Though in very different terms, Shakespeare has put the same question as Pascal, but only to answer it in positive terms:

> 'We are such stuff
> As dreams are made on; and our little life
> Is rounded with a sleep.'

What should we conclude from that? Are we not always forced to return to the facts of life? What should we seek beyond the double aspect of existing strength and weakness? Both are more clearly determined by the forms of emotion that make character than by the intellectual skill that gives them course. Dreaming and observing, with a fair chance of encountering objective reality, are two ways of seeking knowledge that even to conceive what is not must cling to the elements of what is.

Our ancestors, beginning mental life through dreams, made dreaming dangerous for us by habituating us to the facile verbal forms that dominate the empiricism of daily life. We cannot modify by an iota the processes of nature. We do our share if we help forward the compensating evolution on which rests the task of making incoherent aspects coherent. Dreaming came first. That was the fatality of

the first days, fortunately discounted by the to-morrows, though they denied themselves too long to what is surest and finest in knowledge. Defeated by contradictions, what could we trust? Were we to live, like automatons, on the narrow postulates of primitive ages, or were we triumphantly and eagerly to pursue the elusive truth of which all the powers of atavism wished to cheat us?

Assailed not only by doubts but by elusive 'certainties,' which often are merely variations of uncertainties, how could we settle our perplexities amid the turmoil of contradictory affirmations, the more obvious weakness of which made them all the more presumptuous?

HARMONY AND DISCORD

When I speak my last, shall it be a word of mental abdication or of friendly welcome to relative truth, the brightness of which grows with every step succeeding generations make toward increased knowledge? My choice is made. Like every one else, I have lived on the labor of bygone generations. Do I not owe it to myself as well as to those already knocking at the door of thinking life to accept the noble inheritance of labor — even if it be a schedule of conclusions always susceptible of revision?

Proof by experiment is no longer a dream. But before man asked why the apple falls from the tree, for many thousands of years, though face to face with the fact, he preferred not even to wonder about the matter — so simple seemed to him a phenomenon on which Newton based a scientific formula of cosmic action. However, while the evolution that detached the fruit from the tree that nourished it was going on, the mental evolution summed up in the man of science had grown mature during centuries of mingled dreaming and thinking, in order to take form in a scientific explanation of cosmic relations, shown in the discovery of universal gravitation. The fact of such an undertaking is more stirring than any dream; it is the finest crown of thought.

Even in the hour when science triumphs let us take care

not to speak ill of those dreams that hovered over the cradle of the human race, and that at the very time when a universal fog of ignorance can be no longer alleged in excuse still hover over us. Did not our mistakes with their bits of imperfect observation nevertheless help the past to live? Can we forget that fact merely because the bloom of their youthful beauty has faded? Who, then, would care to state, when everything points to the contrary, that we do not, and shall never again, need to dream?

Then why ask us to choose between thinking and dreaming, since to choose is merely to recognize the order of phenomena, when, flowing from the same impulse to inquire into man and into the world, their divergent activities are reunited through the association of their effects? Arising from the same sensations, dreams and thoughts, although different in form, remain convergent in their evolution even in those struggles for preëminence by means of which the law of individual evolution is to reconcile them. Imagination, in sum, builds for us pictures of sensation that it associates or dissociates (abstraction) [1] through the action of an evolutionary synchronism of what is within us with what is without, the harmony of which, forming the whole structure of thought,[2] goes to make up our established knowledge.

To-day our theologies and our metaphysics are buzzing through space in a search for a refinement of 'intuition' which will allow 'doctrine' again to reconcile elements of positive knowledge, conveniently altered to suit their ends. Obstinate in its hallucinations,[3] metaphysical imagination

[1] 'There is no imagination,' says Ribot; 'there are men who imagine.' It is true that there are nothing but effects of sensation represented by means of those images which metaphysics is too ready to consider as independent realities. That, indeed, is Locke's 'realized abstraction,' to which we always have to return.

[2] Is it necessary to point out that this view bears no relation to the 'pre-established harmony' of Leibnitz, since we are considering only the movements of evolution that, having a common origin, are in turn separated or gathered into a complex, itself only the future of gestation?

[3] Our fashionable metaphysicians have at last resigned themselves to admitting evolution — but only to deform it. Bergson sees it as 'creative,' and nothing more. When it leaves his formidable hands, we have nothing but a

will vainly try to adapt itself to the discipline of scientific facts, which it can no longer dispute.

The phenomenon of imagination consists in a continuous eagerness to know, or rather to express, something that is beyond the limits of the known by means of incoördinate images subsequently to be verified. It is in the field of these verifications that the conflict ultimately takes place. However, imagination will still go on suggesting hypotheses, and even anticipating scientific procedures which will evoke renewed observation. No man of sound sense, excluding the metaphysician, expects the full realization of imaginative views. On the other hand, no man of ordinary intellectual power ever advances along the path of scientific investigation without anticipatory hypotheses that seek for new roads. In the scheme of mental operations, imagining and observing thus march in company. 'One saying: "You do wrong"; the other: "'Tis your fault."'[1] Thus the value of mental evolution is measured as much by the power of anticipating correctly as by rectifying honestly.

Is it quite certain that the difference between imagination and the explanations of science is anything more than a difference of degree in the scale of approximate truth? The view is temptingly simple. Isn't it obvious that imagination must have some base in reality and that, as, for example, in the case of the atom, the actual reality sometimes surpasses the finest audacities of imagination? To imagine is to picture the world in unverifiable terms. Science can result only from so ordering, and from so applying, all the images of our sensations of fact that we bring ourselves back as best we can within the limits of a knowledge capable of standing the test of time.

Throughout the conflict between reality and imaginative notions what can be the use of our own natural development, if not progressively to lessen the gap that separates dreaming and observing? The whole life of men and of

'poor thing,' shapeless, colorless, voiceless. Such was the proud Hippolytus after the monster had passed.

[1] 'L'un disant tu fais mal, et l'autre c'est ta faute.'

peoples depends on such a reconciliation, on such a harmonizing of the discord between the two. As a powerful means for suggesting, confirming, developing, and vivifying our scientific conquests, mathematical signs and symbols are of universal measure; that is, they have an ideal fixity which gives body to the hypothesis of an absolute edict. Is it not imagination which always gently corrects the implacable rigor of the action of the world, attenuating the shocks that would too severely affect the emotions, since in them the suggestion of reality may fix the imaginary, and the imaginary may lend its wings to reality?

Thus, man let himself go in the expression of the finest parts of himself — proud of the hardest sacrifices for an ideal that he would never reach. Some dreams are of a quality which brings them on a level with the ideal, which governs our lives only if it rises above reality. Imagination enlarges everything in comparison with the real, but if the romance of idealism has left tendencies to admirable action, then it certainly is our dreams which will make us stoically accept everything from life. It is surely our dreams that will give a superior significance to our fleeting existence; that will show the beauty of it through flashes of hope, the chief value of which lies in the fact that they actually occurred. In victory it can lift us even to the refinements of a wise foresight; in defeat, it rekindles the fires of our energy. Observation stakes out the path; imagination enlarges the traveler's horizon. Without imagination to charm away the pains of knowledge and to light with fugitive hopes our anticipations of the unknown, we should be reduced to the level of animal life, in which dreams are nothing except a mnemotechnical repetition of imperfectly forgotten sensations.

LIVING BY DREAM AND THOUGHT

Where will the knowledge that we have won with our associated dreaming and scientific thinking lead us? It will lead us to live our cosmic life, no longer in a misunderstanding of ourselves and of the world, but in the firm assurance of a reality radiant with the idealism to which the hope of

lending charm and dignity to our lives invite us. It will lead us to agree with one another instead of quarreling, to approach nearer to a peace of an established knowledge adorned with dreams, the attractions of which will for a time enchant us at the risk, if we do not have a care, of straying into error. Good or bad, our dreams have reassured us, aided us, upheld us in our trials and encouraged us with inconsistent consolations that transiently lightened the burden of our lives. Meanwhile, the trials pass, and the dreams of yesterday become inadequate to explain the experience of to-day.

Our primitive ancestor lived in constant companionship with his fetish, making the best of disappointments, just as to-day the faithful do when their divinity remains deaf to their prayers. Along with the evolution of man, the gods themselves have not ceased to evolve, even to the present time. Legends succeed legends only to end in the same emotional exhaustion, the same gestures, the same results. It is so easy to utter, so hard to live, the wingèd word. The world is full of the most beautiful prophecies. They lack only efficacy. Bossuet dared to approve the odious brutalities of the 'dragonades.'[1] Was he as well qualified as he believed himself to be in respect to the deep significance of charity?

Religious rites express absolute beliefs that claim to be free of change, although man never ceases to change. That is the fundamental incongruity. The enthusiasm evoked by an ever-higher aspiration cannot but suggest an ever-higher relative achievement. For developing the energy needed to realize our ideals, other resources of will and other powers of disinterestedness are needed than the modest equipment of sentimentalities sufficient to vulgar lives congealed by the lack of those noble emotions which produce the finest moments of our existence.

What can a morality based on a guarantee of personal salvation at the close of our earthly sojourn do except appeal under the mask of a spoken altruism to the appe-

[1] The persecutions of Protestants under Louis XIV.

tites of an organic egotism revealed in every form of self-preservation? Does not the true believer make a pretty good bargain if he can win eternal salvation at the cost of doling out casual help? Is no higher ambition conceivable?

A courageous acceptance of our terrestrial destiny will sooner or later be forced on us for the benefit of all and of each, for, as the progress of the ages indicates, an orderly evolution of energies is leading us to that point. The more we can give of ourselves, the happier and the better shall we make our lives. Ignorance can only cause us to recede, for ignorance means the predominance of a superannuated atavism. The primary effect of an incipient knowledge of the world and of ourselves was first of all to exalt us in our own eyes. Were we the imperfect products of a divine perfection, we should have in prospect only degrees of failure, because of our inevitable inadequacies. If, on the contrary, we are the result of the progressive evolution of organic relativities, we are starting on our way toward future greatness. If that be so, how can we, merely for the sake of wrapping ourselves in incoherent dreams that carry us nowhere, resist the appeal of the joy of living within the domain of knowledge? What nobler fortune can there be than to live valiantly according both to our dreams and to our thoughts? Doubtless the dream prevails at first through the ease of following the path of least resistance. But thought eventually wins to its rightful place through the positive authority of verified observation. The whole history of man consists in that never-ending conflict in which imagination has the advantage of a free field in every approach to the unknown. To dream is to hope. Whoever has not set himself up an ideal beyond his reach and tried to live in accordance with it has not shown himself worthy of human life.

CHAPTER VI

KNOWING

I

THE PHENOMENA OF KNOWING

IN what can consist the biological explanation of the phenomenon of 'knowing' by the terms of which a synchronous, concordant relation is established between the objective world that makes the impression and subjective man who receives it?

Metaphysics, creator of entities, claims that it finds in the phenomenon the manifestation of an 'immortal soul,' though the bonds connecting it with the organism have never been disclosed.

On the other hand, the elementary researches of scientific observation show that there are in us registers of sensorial reactions, which, either aligning themselves in resonant unison with their exterior causes, or discordantly clashing with them, make or break the harmony of our assimilation of exterior fact. Successive states of sensibility form a keyboard of coördinated sensation which makes us feel, interpret, and know the outside world, so far as it affects our receptive surfaces. Discordance constitutes lack of comprehension. Harmony, through organic assimilation, determines 'knowledge' at every stage of biological evolution.

All the treatises on biology note the fact that our sensations, received from the exterior world, make our sensitive neurons react in the form of images, and metaphysics claims a somewhat premature triumph because we do not know anything of the world except through those representations.[1] Let us take that exhibition of the phenomenon just as it is offered us and see to what explanations it may lead. All the activities of the world react on our sensitive surfaces

[1] The telescope shows us nothing except the images of stars. Is not that enough to enable us to infer their existence and their motion?

in combinations that correspond in every detail with our sensations. In general, we hear only of images,[1] a word which, in effect, pictures the most striking aspect of the phenomenon, because in it the visual sense is dominant. Since the whole performance consists of analogous vibrations that to our visual sense appear as a figure as perceptible to observation as if it were on a photographic plate, I can but accept the common formula when properly explained.

It has, therefore, come to be recognized as a constant fact that on all impressionable surfaces — that is, sensitive in some degree — torrents of images flow like the thousand sun-glints on water, kindled only to be extinguished as soon as kindled and then immediately rekindled, and so on *ad infinitum*. Of those images, developed by means of chemical sensitization, photography does nothing except reveal the picture already imprinted on the nerve-surface by the vibrations of waves that are radiated, superimposed, or intercrossed in every direction. Fleeting, invisible figures which no reactive agent has made appear everywhere succeed one another in the same way on surfaces of various degrees of sensitiveness, making serial revelations that, could we make them reappear in reverse order, would allow us to reconstitute the film of the history of the actions of things since the beginning of time.

But at this point considerations of another kind present themselves. The vibratory waves are not light-waves alone. They are by the same token electric, magnetic, heat and sound waves; that is, waves of every kind of dynamic activity which, each in its own way, react on our sensory surfaces. Modern science has reached the point of seeing no more in them than types of perpetual motion. Transmitted from the surfaces that make an impression to the surfaces that receive it, they are registered by us, and that interweaving of everything, from everywhere, at all times, goes

[1] The word 'representation' would be more exact, for it can be applied to the reactions of all the senses. I keep the word 'image' because it is found in all the books on the subject, and understanding is thus made simpler. The phenomenology should necessarily be of an identical kind in respect to all the sensations derived from vibratory waves.

to make up what we call our sensation of the exterior world.

At the radium mines in the Joachimsthal your guide will let you photograph his key by means of the invisible radiation from the metal disintegrating in the bosom of the earth. Later I shall discuss the question of 'dark light' [1] and of 'photography in the dark.' It appears that the unending motion (which, together with matter, Descartes maintained constitutes the world) is infinitely intensified or attenuated according to the amplitude of its vibratory waves.

The mutual penetration of the vibratory waves necessarily presents positive or negative fields, the play of which gives the phenomenon its character. The surface that receives and registers the passing image (whether visible or not) discharged on it responds in its turn with a counter-offensive of reflected rays. And if we could confusedly conceive the spectacle and record the formula, it would appear to us an inextricable confusion rather than as orderly motion. In truth, the inadequacy of our organism matters little if the actual phenomenon is established on a firm scientific basis.

Evolution becomes accelerated at the moment when amid the tumult of the surfaces of simultaneous reception and emission, the organism presents a sensitive, membranous surface on which in a photographic manner physiological chemistry provisionally sets up that organic state which constitutes the phenomenon of continuous sensibility termed 'organic consciousness.' The multiplicity and the rapidity of successive impressions, which no biological reagent has sufficiently fixed, make unconsciousness or inadequate consciousness of things, whereas the organ providing the nerve cell with the necessary fixative prolongs the activity of the vibratory waves and gives them the more or less extended existence that, through the progressive forms of the whole living series, constitutes that organic consciousness on which the graduated scale of knowledge is based.

When from so prodigious a distance the stars affect us by

[1] The expression is inaccurate. 'Invisible light' would be more exact.

means of light-waves the effect of which the chemical eye of the sensitized membrane registers, what can the fact mean, if not that there is a status of the general energy to which is confined the action of a recording apparatus that takes note of regular movements during the period of their duration? And, as the vibrations of the subject receiving the impression from the object giving it are inscribed as a whole on the registers of our sensibility, we acquire the sensation of an organic consciousness of things throughout the successive activities of life. That is, we acquire the more or less complete knowledge of the effect of the passing incidents of the world on our sensibilities and the chance of vibrating in unison with them. The spectrum, whether light or dark, with its multitude of rays susceptible of being diversely perceived, indicates new opportunities of knowledge — soon to show clear — which both terrify and delight us.

The phenomenon is clearly of the same kind as the classic phenomenon of resonance, in which two elastic bodies, capable of giving forth the same sound — that is, having the same number of vibrations a second — have the property of vibrating in unison. The resonance of the tuning-fork or of the waves utilized in photography may be said to be only the particular manifestations of a general phenomenon, the kinetics of which are not unknown. We can already understand that the universal penetration of vibratory waves, implying all possible interrelations, reveals fundamental correspondences on which all that we can know of the world is based.

On that ground the rhythmic fermentation of wine in the cellars in spring and in autumn is particularly striking. The simple vine-grower sees in it the effort of the sap trying to rise in the barrel or in the bottle as naturally as in the stem of the vine. He instinctively notices a striking correspondence between the free and the imprisoned sap, both simultaneously awakened at the beginning and at the end of the winter repose. Nothing, in fact, seems easier to conceive. But what hidden communication can there be between the branch of the vine and the bottle that encloses

the energies of its sap? That is what we should like to know, and what the rustic does not trouble his head about.

In order to elucidate the mystery, I felt I could not do better than to apply to Dr. Émile Roux, director of the Pasteur Institute. That distinguished scientist told me first of all that what ferments in the bottle and in the wood at regular periods is the old barm at the bottom of the closed receptacle, and that eliminating it by means of a porcelain filter prevents further fermentation. That seems clear.

There remains nothing more to know except why the old barm becomes active at the very time when the sap makes its first or its last ripening effort. Temperature suggests an explanation. As a matter of fact, the supposition seems plausible. Are the heat of May and the heat of September on the average identical? Perhaps. Wine-makers are careful to-day to keep the temperature constant in well-run cellars, and yet in those cellars the fermentation of spring and of autumn goes on as regularly as it goes on in others. So Dr. Roux, the greatest authority on the subject, did not hesitate to tell me that the explanation of the two phenomena necessarily lay in the law of the cosmic phenomenon that controlled it. That was exactly what I expected him to say. Rhythms of cosmic vibrations — such is, until a better one be forthcoming, the most natural explanation.

After the rest of winter, marked by a lowered temperature, artificially produced with a view to testing the seed of silkworms, all the fermentations become active, all the organisms are at work, as is shown even in the rutting of animals. The whole planet is stirred. When the vegetable sap leaps upward, how can the rest of vegetable fermentation fail to follow its movement? It is a typical cosmic phenomenon that we may designate by an x, but that strikes us as clearly in the mass as in the minutiæ of its manifestations. The same activity occurs in autumn at the end of 'the second sap,' when the approaching frosts dissipate the supreme intensity of the phenomenon. Accords or discords of rhythmic vibrations — that is all we can now say.

The best-known example of the correspondence of vibra-

tory waves in a sort of symbiosis is the resonance of the tuning-fork and the echo. The simplest generalization is enough to suggest a rational explanation of the progress of knowledge through a chance synchronism between external vibrations and the internal vibrations of a sensitive nervous surface. That correspondence seems to me in every respect comparable with the classic phenomenon of resonance, in which two elastic bodies, capable of giving off the same sound — that is, having the same number of vibrations a second — have the characteristic of vibrating in unison.

Le Dantic has brought out the phenomena of resonance with remarkable clarity. If the universe really is, as it seems to be, a system of continuous transformations of universal vibratory waves in different forms — heat, sound, electricity, light, magnetism — the colloids of our organisms act the part of resonators. The brain being regarded as a 'resonator' adapted for the analysis of complex sounds, what is called 'assimilation' is merely a phenomenon of resonance and is found in living creatures as well as in all natural substances. We can see in it only a transposition of chemical, physical, electric, or colloidal equilibrium. There are no other differences between organic and inorganic chemistry than those which lie in the condition of the molecular equilibria which occur through the interplay of rhythmic oscillations without beginning or end. There is no 'vital principle' except in the lucubrations of metaphysics.

If you make tuning-fork *A* vibrate, the sound-waves are concentrically propagated and reach tuning-fork *B*, for each new wave, finding *B* fork in a favorable position, tends to increase the width of its vibratory displacement, just as by pushing a swing or a bell to the extremity of its arc you increase the width of its oscillation.[1] Tuning-fork *B* will be

[1] When a pendulum (a swing, a bell, etc.) is moved from its equilibrium and left to itself, it oscillates with a rhythm that is always the same, no matter how much or how little it was pulled out of plumb. For example, it 'marks the interval' when its oscillations are feeble, as well as when they are strong. The

set vibrating in unison with tuning-fork *A*. We can say, then, that tuning-fork *B* has *knowledge* of tuning-fork *A*. If tuning-fork *B* has not the same vibratory period as tuning-fork *A*, the impulsions received are no longer concordant. They nullify one another, and, for lack of a sufficient number of waves flowing in the same direction, the inertia of tuning-fork *B* is not overcome. It therefore remains mute. In other words, it *has no knowledge* of tuning-fork *A*.

In the same fashion, the voice of a singer induces the vibration of the piano string that is in accord with it. Thus, again, the howling of a dog will make the sides of a glass vibrate, if its vibrations have the same rhythm as the dog's howl. According as the vibratory period agrees or disagrees, the piano *knows* the singer and the glass *knows* the dog, or does *not know* it.

Can we avoid being struck with the analogous phenomena in the transmission of vibratory waves between the tuning-fork of the world and the tuning-fork of our nerves? According as the vibrations from without and the vibrations within (named sensations) attain or fail to attain the unison that unites them, the synchronism of the vibrations of the sensitive neurons with the vibrations of the cosmic elements creates our knowledge of things. And the first discord drops us back into ignorance or mistake.

same law reappears in many systems of very different kinds; for example, the oscillation of the electrical current in any given conductor.

Take, then, any object capable of a fixed rhythm — say a bell — having a period of one second. The bell-ringer gives it a push; the bell moves — slightly — but it already oscillates almost imperceptibly with its one-second rhythm. The bell-ringer gives it a haphazard second push; the effect of the second push is not generally added to the effect of the first. After successive haphazard pushes the motion remains very slight. But if the bell-ringer gives the second push just when the bell has made its full return swing and in the direction indicated by its original position, the effect of the second push, instead of being to check the effect of the first, will be to add to it, and the radius of the swing will be doubled.

In the same way a third push can add its effect, and so on with successive pushes, provided that the bell-ringer observes exactly the rhythm proper to the bell. In that event resonance develops, and the motion of the bell goes on increasing until friction imposes a limit to the length of its swing.

The theory is the same for all resonance, as, for example, electric oscillations. Photography may be said to be only the fixation of a phenomenon of visual resonance. (Note kindly contributed by an eminent physicist.)

Knowledge may thus be said to be a system of attuned vibrations that leaves room for ignorance whenever the vibrations do not accord. The cosmic waves, in continuous motion, can efficaciously act on our organic waves, also in continuous motion, to produce the effect of knowledge only when, as regards vibratory action, they are in a state of identity productive of unison. It is the ubiquitous recurring phenomenon of resonance, the effects of which vary according to the form and the composition of energy. In the case of our receptive nervous surfaces a period of resonance creates a period of assimilation, of fusion, of identification, that constitutes the organic state of knowledge. 'To understand,' Raphael is reputed to have said, 'is to equal!' Perhaps we can say even more exactly that to understand is to be identical.

Among the reactions of man to the exterior world, consciousness and knowledge may thus be termed phenomena of organic synchronism, neither more nor less marvelous than any other phenomenon of an organic or even of an inorganic kind.

To sum up, the world appears to consist of vibrations, the waves of which are unceasingly interchanged, as if each were replying to all and all to each: 'I am here!' It is an unconsciousness, or a rudimentary consciousness, in the inorganic order, with its chemical reactions, that we are able to fix by photography, and that is the obvious equivalent of 'Here am I.' A more or less acute consciousness results when the vibrations come into contact with the more or less sensitized nervous cell. The surface that receives the image, the fate of which in the rush of intermingled images disappearing as soon as they appear can never be revealed, has nevertheless some chemical form of an inorganic knowledge of the object the radiation of which sets it into motion. It obscurely reacts to the shock, whereas the sensibility of the nervous organism will display itself in subtle refinements of vibration, in which those accords which constitute human knowledge are made manifest.

It is admitted that the reactions of our sensibility take

the form of sensations, and that those sensations are translated for us in the vibratory apparatus of the neurons into series of images which give us the impression of continuity. We know those images. They are the same which we met on the sensitive plate on which the chemistry of photography fixed them. When I stop them as they pass over the sensitized screen of my sensitive neurons, it is the function of organic action to reveal them.

Experimental psychology seeks to determine the ulterior function of that succession of more or less precise sketches. Continually superimposed, or rather imbricated, the images subsist sometimes in the form of comparative misconceptions, sometimes in arrangements more or less suitable to produce the accords necessary to knowledge. In the main, they are associated or dissociated in organic 'complexes' in which are ranged the fixations of knowledge that we call 'thoughts.' That is the domain in which, under the wing of an imagination suffering from hypotheses, the analyses and the syntheses of our experience are propagated.

Are we to assume, then, that we have exhausted the organic phenomenon when we have tried to dig to the very roots of the formation of knowledge? Putting aside such use as we can make of our knowledge, can we say that consciousness of our contact with the exterior world exhausts the resources of our sensibility? I should not like to assert it.

If it is agreed that all manifestations of world-energy, headed by light, can virtually be reduced to forms of electricity — which seems to lead us to the unity of energy — our only remaining problem is to find out to what point the vibrations of the universe can affect the human receiver, which in its turn is and can be itself no more than a mass of vibratory waves. On the ocean of things the meeting billows can but oppose one another, or cross one another, or go with one another, which latter event implies a parallel development. Conjunctions of unconsciousness, and interpretations of organic activities, with a view to the progressive appearance through the whole range of life of an excessive sensibility (hyperæsthe-

sia) styled 'emotivity,' after starting the phenomenon of knowing, perfect it, or have a tendency to perfect it, in the full harmony of perfect contact.[1]

For, if sensibility is thus at the base of knowledge, we perceive by observing ourselves that it does not cease to transfuse knowledge, to sustain its growth, and even to go beyond it. Insufficiently kept in check by the restraints of observation, the exacerbated sensations, transmitted from the local organism in more or less orderly organic prolongations, complete with sentiments and with emotions of varying intensity the relativities of a knowledge of which they are the liveliest expression. They might well be the finest thrills of life in which, amid a tumult of error and knowledge, the calls of an ideal so beautiful that it is enough for our ambition to have listened to them, though without being bound to respond, these thrills are kindled, glow, and become enchanting.

DETERMINATIONS

If we consider the matter carefully, we find in the phenomenon of the photographic image a mere reflection of the vibratory waves, called 'light-waves,' from the surface that stops them and that sends them back in obedience to the law by which the angle of incidence equals the angle of reflection — as in the case of the echo. The striking similarity between the vibrations of sound and of light seems to indicate that they are akin. The ray of light hits the opposing surface and leaves the imprints of its percussion, the sum of which necessarily makes the image, whether revealed or not. Whether alike or different,[2] all cosmic activi-

[1] Compare with this remark the use in the Bible of the word 'know' to express the union, the complete fusion, of the two sexes. Love is in effect a phenomenon or resonance, an identification of organisms.

[2] Without stopping to consider the length of the waves, it is enough to remember that the velocity of the sound-wave, a purely mechanical vibration, is 340 metres a second, whereas the velocity of the light-wave (electro-magnetic in origin) is 300,000 kilometres a second. Light travels in vacuum, which sound does not. As a vacuum is filled with an unknown imponderable elastic substance which we call 'ether,' light becomes the product of its periodic vibrations, and the composition of different phenomena brings it about that the meeting of two phenomena of light may produce obscurity.

ties are carried on through radiating waves that affect in different degrees the sensibilities of the individual. Consequently each sensorial phenomenon is caused by organic reactions rising from contact with waves from without and with waves from within, which associate and dissociate images fit to set up a state of mental sensibility; that is, an organic complex of emotion and thought which is an acknowledgment from the organism that is determined to the world that determines, and which is conveyed by means of the continuous reactions that at each stage of life form consciousness.

Such a view is worthy of consideration as much for the definiteness of its formula as for the extent of the generalizations it suggests. The 'prodigy' of human consciousness, which, like every other phenomenon, remains a prodigy only until we can begin its experimental analysis, should receive its legitimate place in the harmony of relative knowledge in which our destiny fulfills itself.

Between elementary organisms and *homo sapiens*, whose sapience revealed itself gradually, we meet — in spite of the resistance of atavism — series of coördinated organisms in which observation discovers no bond except one of sequence — stages of sensation, varying degrees of consciousness, and knowledge, along with all the reactions of organized life. It took Lamarck and Darwin to dare to put man in his proper place among the developments of the universe. But their view would still be merely an extremely plausible conjecture, could we not leap over the long period of inorganic existence to the first appearance of organized plasma.

The once famous hypothesis of 'spontaneous generation' was nothing more than an attempt to minimize the miraculous. What is plainer than the glaring fallacy of the word 'spontaneous,' which absurdly destroys every idea of logical sequence? The task had to be begun again by using methods proceeding from successive physico-chemical activities to the organized seriations that we now call evolution. The observation of atomic and molecular activities opened to investigators unforeseen realms in which the inexhaust-

ible energy of men of high intelligence found limitless scope for its efforts. We are now at the heart of the phenomenon. Can we not delineate some part of its outline?

After all, it is well known that the whole Cosmos, including man, consists of vibratory waves in which forms of energy constantly find expression — forms of energy so firmly knit together that we cannot separate them for purposes of study except by means of evocative and conventional symbols of speech. Now, the more we detach the verbal sign from the act it seeks to express, the more an obvious deflection of the sense tempts us to interpret the sign as representing something real. It is only fair to say that the deflection itself is not without its compensating value. In it we find the incentive to man to rise above himself toward a chimerical view of what need not even exist in order to dazzle us with an appearance of reality.

If our subjective Divinity had stopped at that point, the evolution of knowledge might perhaps have kept him under varying names in the most obscure regions of our emotional nature. Through the inevitable reaction of things, we have suffered from the mental inadequacy that created him. Centuries of teaching benevolence ended only in massacres and in the martyr's stake — centuries which, from our ephemeral point of view, express themselves in cruel sufferings inflicted on mankind, and which only kindly death will permit us to forget.

Is it, then, so hard to recognize ourselves in the phenomena of mental evolution? Could man have protected himself from materialized abstraction at the very time when he was moulding it — a living thing in the impassive universe — in order to entrust to it the best of his volitions? Progress toward the most elementary ideal at first required that the ideal should be visible, however fashioned. The blindness that followed as a result of having wished to look at it too closely is explained by our rudimentary retinas. The inevitable rectification is in process of accomplishment.

The stubbornness of phenomena does not wholly exhaust our enthusiasm for research. The glamour of knowledge to

be attained constantly calls out new reserves of energy. The great virtue of an ever-present, ever-retreating ideal is to revive our strength, and the disappearance of Divinity has subtracted nothing from its driving power. So strong is its impelling force that the whole of life is determined by it. Indeed, it often seems to carry us beyond the ordinary measure of our organic energies. It awakens an aspiration to complete the process of evolution and fires us with a desire to anticipate a future in which we shall rise superior to hereditary habit.

Meanwhile, let full justice be done to the achievements of language. If the deviation in sense of the imaginatively materialized word confined us too long to a dramatic misinterpretation of the world and of ourselves, let us not forget that it was provisionally helpful to us, and that the natural development of scientific knowledge was enough to allow that same language of theoretical error to leave us a new power of depersonalized idealism; that is, an idealism freed of all its concomitant hallucinations. No words, no divinities. But again, no words, no idealism, since words are required for those visions that evoke new effort toward what is to be. In our inadequacy words led us astray. When once again words shall have been given their proper human value, they will again become our guides and will inspire us to go beyond our immediate aims with an irrepressible ardor for the future. Let the word, which is the vehicle of the ideal, remain sacred for us.

Nevertheless, a prolonged expenditure of energy gives us access to the fundamental simplicity under widespread complexities of the universe. I have said that everything seems to go back to the play of vibratory waves. The solid state, as of rocks or sediments, hides its universally kinetic character from our senses by having an appearance that is merely the result of the native incapacity of our sensorial organs. The gaseous state disconcerted us with the disordered agitations of movements which, until very lately, the grossness of our senses did not permit us to explain. The liquid state, finally, with the rustling of rain, the irrepres-

sible flow of rivers to the tumultuous ocean, allows us to see a spectacle which appears most typical of the hidden motion of the cosmic depths.

In the stormy waves that unceasingly rise and fall, we find changes of conditions wherein the acuteness of our sensations tries to identify with the root of that general activity which we name 'energy.' It is a hand lifting the veil of an Isis whose mystery lies in the appearance of existing. Is it not the fate of our knowledge that it must forever batter at some joint of the world that will not give way? All we can do is to apply names and a logical order to our passing sensations of movements *that are because they are*,[1] and so to guide them that they will serve our needs.

Everything thus reduces itself to meetings between the Cosmos and that complex of organs which constitutes the individual, who like limpid water is endowed with the property of reflecting what is outside him. Meanwhile, words supply him a means with which successively to define his organic reactions in a more or less accurate way. 'Words, words!' mocks Hamlet. Speech is none the less our supreme privilege; it is at once the most obscure and the clearest representation of what we are able to grasp of the linked realities of an integral progression that has neither beginning nor end. In the measure of my ability I notice a passing wave, and when I am asked to throw light on the transient thing, I reply that my discovery is a phenomenon which neither begins nor ends. That may not be much progress. It is, however, obvious that my provisional, relative explanations allow me to know a little, and even much more, of cosmic reactions than either Moses or Manu could guess.

My worthy friends, intoxicated with the Absolute, loudly complain of my intellectual poverty; for my part, I should applaud their own riches if they would be good enough to let me see an inventory of them. Their Absolute explains everything; but of the Absolute itself they tell us nothing.

[1] Herbert Spencer was able to avoid trouble with English orthodoxy by putting beyond the reach of scientific observation a region reserved for an unknown Power that the clergy might make their own intangible domain.

They say to us: 'It is.' And although that is all I can say of the scientifically observed Cosmos, I at least have the advantage of that experimental verification which the Absolute cannot tolerate.

Let the Absolute excuse me if I part company with it in order prosaically to halt before a representation of the universe as energy, which shows me movements eternally colliding, recoiling, interpenetrating, separating, only to unite again according to the laws that condition their relationships. So looked at, the universe defines itself in the terms of our relativity as an orchestra of emissions and of radiations associated in endless transformation. The cycle of infinity is thus made complete. Have not the existing vibratory waves, demonstrated physically by the echo, chemically by photography, physiologically by sensibility, the same phenomenology? We have seen the spark of a conscious Ego flash into the light by means of our analyses and syntheses of relationships. We have noted a sensation of self progressively formed by synchronous waves like those of two harmonized tuning-forks. Even degrees of misconception find their explanation in an interrupted synchronization.

Better still, when the phenomenon of evolution presents itself in the course of our analysis of world-phenomena, instead of seeing it rise along with other prodigies like a conjurer's devil, we discover in it simply a system of continuous vibratory undulations in cycles of fresh rays. In what direction and for what successive phenomena does the synthetic cycle of coördinate evolutions move in infinity? That cycle we cannot conceive, for we can grasp only a moment of it. The curve will be all the harder for us to plot even hypothetically, since, according to the calculation of probabilities, the length of its duration exposes it to the chance of stellar collisions, the frequency of which, to the extent that the mathematics of the universe requires, is part of the world-order.

We do not know where our sun is carrying our earth, and the direction in which Hercules moves is really of no help,

since we do not know the course of Hercules. We know only just enough of the stars some day perhaps to find pleasure in conjecturing what landmarks of space they may pass. We are embarked on a train where, had not Einstein somewhat discouraged us, the stations we have passed might permit us to foresee no one knows what coming junctions.

Through the bypaths of corrected misconception knowledge has found the 'inaccessible' spaces recede before it; but the impenetrable unknown is too vast for our relative faculties. The impelling force of our unalterable destiny commands us to resign ourselves to the fact and to make up our minds to know only what we know, without either renouncing the drill or erecting barricades of words in order to give a show of knowledge to that of which we are ignorant.

If knowledge can be explained as a synchronism, such as that of the tuning-forks, of vibrations uniting subject and object in corresponding waves common to both, which inscribes on the sensitive nervous system a consciousness of the outer world, the result is something like the equivalent action which makes a choppy sea. It is a soothing of the sensitive antennæ rising above the organic surfaces,[1] an interdependence of synthetically awakened sensorial reactions, a joy of perfecting ourselves, that becomes the beginning of an exaltation suggestive of the superhuman.

I will not abuse the skillfully combined systems rendered incoherent by their faulty logic.[2] I think, however, that I am justified in saying that the so-called explanations of 'reason' have led us into as many mistakes as has imagination, because the logical chains of knowledge that they pretend to set forth are too often broken by ignorant assumptions to which we attach the greater value because all forms of ignorance unite in recommending them. I decline

[1] We can assume even in inorganic things all the degrees of physico-chemical receptivity that escape the coarse measure of our organic sensations.

[2] See Descartes trying to rationalize the world and from the very start excluding God and the King from the field of his reasoning.

to draw from the actual state of humanity too easy inferences as to future developments. It is easier for a prophet to dilate on the future than to confine himself to the past.

In sensation properly so-called, as in its translation from feeling into knowing by means of the cerebral switchboard, evolution supplies growth, and even refinements of energy of all sorts, without succeeding, so far as I can see, in changing the profound elements of the problem of mind. At the two poles of the faculty of feeling — pleasure and pain — the table of nervous receptivity will surely increase not only in range but in sensibility. Through superior training many more delicate sensations can attain to higher achievements of knowledge — but always knowledge that is approximate — wherein the inability to know will resist the power to aspire.

I hear it said that the noble joys of the scientist are only for the few, and that if a man does not take care, the selfish eagerness of his effort to know will dry up even those springs of fortunate (?) ignorance from which the living fountains of enthusiasm are miraculously nourished. Thus, it would appear that the more we knew, the less we could feel and thus suffer the loss of what is best in us — as if sensation and knowledge did not supplement each other instead of opposing each other. We need not worry. The curve of man's evolution will continue to govern the path of the whole man. For a long time to come there will remain ample store of ignorance for the disorders of sentimentality. We need not dread knowing too much, and on the day on which our ardor for investigation shall grow weak our emotions will not be merely endangered — humanity will automatically end.

Instead of endangering the full enjoyment of evolved organisms, the two allied paths of progress toward the infinite — imagination and experimental research, that is, what we dream and what we establish — contain many fine hours. Sakya Muni, Jesus of Nazareth, and Francis of Assisi were not men of science. They prevailed through

sentiment before the hour of knowledge had dawned. If we rely on our observation of the universe, our sentiments can end only in achieving a higher congruity with every form of verified experience.

Accumulated knowledge will only lead us to a better understanding of ourselves and to a surer self-guidance — a fortunate law through which, in proportion to what we succeed in knowing, we gain in power to develop a reciprocal human helpfulness, the noble aspiration toward which will never be lacking. Fénelon, a slave to rites of which the Nazarene knew nothing, reached the apex of his inspiration in an address to the Duc de Chevreuse: 'Be faithful to what you know, so that you may deserve to know more.' What would he have added had he known enough to understand the absence of all personal merit in him whose ignorance of the world and of himself leads him to aid his fellows only for his own personal interest? From the summits of thought emotional understanding is exalted to an appreciation of spontaneous benevolence and leaves to inferior minds the need of recompense. He who helps another is himself helped in his profoundest self. In that arbitrament which turns over the world to the judgment of man and man to the searching retributions of his own deeds, the highest reward is found in the silent nobility of a destiny well-fulfilled. Unless one accepts that simple and lucid view, everything becomes mere incoherent fancy. Every man, whether he turns away from it or follows it, sees his allotted time go by. Because Sardanapalus would recognize only his dreams, he was forced to build himself thereof a monstrous sacrificial fire.

Every passing day affords me proof that I am renewed through the continuous action of emotional understanding. I intend to cling to it with all the strength of my will. I do not know much, but I cannot consent to have anæmic ignoramuses pretend to prove to me that I do not know what I do know. I do not know much, but of what I do know I proudly accept the consequences, which primarily form an item in the account of what I owe myself from my-

self, before the tribunal at which I judge the incidents of my own destiny.

Above human suffering there are regions in which we may attain the peace of noble joys. And even if it were not so, an aspiration toward a higher justice, felt if not realized, would still overcome the torment of him who has not asked for life, but who strives to put into it an element, a deed, that partakes of his own personality. There was imposed on me a relentless law of life that improves through the evolution of an Ego the growth of which in constructive sensibility exalts me and keeps me exalted above the conscious and unconscious activities of which I am the result. What more can we ask as the ephemeral criterion of a brief existence? Sovereign power over myself, due to my individual resolution, makes me free either to live or to die. And if I choose to live, what finer task could I have than that of spending the best of my vital forces in ever-greater effort? Even at the risk of not succeeding, let us try to get from ourselves more than is possible, and above all not to deify ourselves on that account. 'Whoso would act the angel,' says a formidable believer, 'plays the fool.'

ALWAYS IMAGINE; ALWAYS OBSERVE

Knowledge, I have said, is the successful study of relations. But what could we make of those relations if they were independent of one another, and if we were incapable of establishing among them comparisons and distinctions through which an idea of their logical connection would be inevitable? That is what, correctly speaking, we call the phenomenon of thought, which consists especially in classifying relationships[1] according to an essentially human scheme of the world and its forms.

Thus, to know — to think — is to classify; that is, to classify through experimental inductions aided by imagination, which allow us to distinguish the states of objectively connected phenomena. In that process lie the fundamental causes of the common mistake that leads us to attribute to

[1] See the *Categories* of Aristotle.

what is outside ourselves the same compartmented arrangement that we subjectively create — only later to raise insurmountable difficulties in the way of our understanding them. That is what we shall see when, entering on the problems of biology, we bring up the famous question of 'species,' which, confounded in 'evolution,' appear separate by reason of the subjective partitions.

To know in advance where we stand in regard to matters that will be fully treated later, it is necessary now to note the kinds of differentiation and of resemblance on which the intellectual operation of our classifying is based. It is a question of observation and of imagination.

To look closely at the matter, sensation necessarily precedes observation, which presupposes an effort of attention, — something like a sustained sensation. Doubtless a question of knowing whether, or rather how, the need could have created the function still remains unanswered. Ever since the first stain of pigment organically developed in the infusorian a definite visual organ, the action of light on skin of every kind has been undeniable. It seems obvious that the Lamarckian training of sensation must have led to the perfecting of the organ. At what moment did this phenomenon occur? At all times, or never; for evolution, adequate to the creation of life itself, does not let itself be interrupted in its progress. However far we go back toward the sources of the phenomenon, we always find something precedent at which our power of penetration stops. All that I now can say is that observation, or, in other terms, the effort of a sensation made precise, varies in value according to the precision of our objective knowledge of the relationships to be connected. Pertinently to approach the infinite phenomenon at some point, I have no other means than the successive confirmations of verified experiment.

'Putting mathematics aside,' Ribot [1] tells us, 'all the sciences of fact from astronomy to sociology, presuppose three stages: observation, conjecture, verification. The first depends on external and internal senses; the second on

[1] *L'Imagination créatrice.*

creative imagination; the third on acts of reasoning, though imagination is not excluded.' These words should be borne in mind, for, with the progress of the individual acquisition of knowledge, we determine the orderly stages of the general evolution of the human mind. I recognize the fact even at this early point. The history of thinking man will soon show us that the procedure is itself born of the metaphysical aberration that, for a basis of knowledge, contents itself with an incomprehensible jargon beyond the reach of any attempt at verification. The phrase, 'creative imagination,' like the 'creative evolution' of Bergson, seems to me singularly apt to distort the objective data of the problem. To keep either in science or in metaphysics the word 'creation' in the sense that the Bible gives it can but make us revert to conceptions that have lapsed. And if we try to use it in a different sense, it would perhaps be better to have recourse to another word.[1]

Does saying that we *create* ourselves every moment through the fact of evolution lead us anywhere? Creation *ex nihilo* is the trick of a prestidigitator, master of illusion. The creation of something within something is modestly called an 'emanation' as, for example, in the cosmogonies of India, or, better still, an 'engendering.' Our Ego, which is organically determined, but which, metaphysically is permanent in its eternal essence, takes on new forms from age to age without the *parti-pris* of the dogmatists' consenting to notice the fact. Determined, determining — that is the whole story. Is nothing, then, created except words? Bergson does not say so. He declares that EVOLUTION CREATES *as our need requires, not only the forms of life, but the* IDEAS *that enable the mind to understand both it and the terms that serve to express it.* These

[1] To be precise, Ribot tells us that he intends 'to seek the fundamental conditions of the creative imagination and to show that it has its origin and its principal source in the natural tendency of images to become objective — or, more simply, in the motor elements inherent in the image — and then to follow it in its development under its multiple forms, whatever they may be.' All that seems to me pretty remote from the primitive idea of creation.

are high-sounding phrases. They all come from inability to tell us what is meant by the word 'creation'!

To attain something higher than the reproductive imagination — that is, memory — something new, we are told, is needed; something reserved for the productive or constructive imagination. I am much afraid that the matter is not so clear as it may seem. Science daily encounters 'new' phenomena which subsequent study puts into their proper category in the system of knowledge, and yet no one thinks of terming them 'creations.' We are told that the two principal processes of the creative imagination are personification and comparison, with the aid of analogy and metaphor. Without deliberately changing the sense of words, no one can maintain that anything of the sort constitutes a creation. I can see it only as a single, unchanging procedure — breathing the breath of life into everything in the world by means of analogies. Thus it is that, as I have shown, the gods were made. In that sense it can be said, and I have myself so written, that we 'created' them out of our imagination. The plain fact is that we conferred on words — interpretative signs of things — the fictitious attribute of a personal activity — and that on that arbitrary notion we superabundantly bred myths of every kind; that is, religious romances which had their day of greatness. Representing those resemblances — with their train of metaphors — by signs until the first differentiations of analysis were made constituted the first steps of knowledge. 'Creative imagination' conceals under its appearance of being a scientific formula the undeniable fact that the 'creations' of our imagination consist simply in deforming and in arbitrarily assembling fragments of observation more or less exactly remembered. I quite understand that Ribot intends simply to define 'creation' as an arrangement of certain materials according to a definite type. Then why use that word, which is generally employed in a quite different sense?

At the two opposite poles of our mental activity, imagination and observation are the inexhaustible sources of our explanations of things and thus of the consequent emotions.

In all their varied conflicting or harmonious movements we can say that they express the whole of man according to individual character, which in every case is determined by the proportion in it of the two phenomena. From the poet to the empiric, all men need the sensation of what is, and the emotion of what may be beyond the grasp of our relativity. Hence, our first sensations are the products of a contact between our sensitized surfaces and elements of the Cosmos, followed by a reaction the more emotional the less we concentrate our attention upon it. That is why the impulse of the imagination, which is eternally afraid of suffering and eternally seeking pleasure, is for that very reason ready to accept everything in the way of transient satisfactions, even at the risk of distorting the objective reality that stands in its way. Thus, because all distortions find their reason for existence in the constructive organism, they remain closely bound to the inadequate observation which is the base of the imaginative thesis. That is why imaginary monsters are never anything except distortions of observed forms. And how can observation itself, manifested in an impulsive explanation fitted to the individual understanding, fail to supply the *substratum* of illusion with which our flighty imagination is only too ready to be content? Is not imagining thinking in terms beyond the limits of what belongs to the universe, in order to supply man with joys that he invents now to supplement his knowledge, now to complete it?

The Cartesian theory that there is nothing in the world except matter and motion should take into account the feelings that are grouped around every aspect of things, the principal purpose of which is to satisfy the primitive need of a germinating idealistic synthesis. However, scientific knowledge feels that it must construct a mechanical Cosmos, and 'beautiful souls,' often emotional in direct ratio to their ignorance, complain that we do not suggest to them views, even though dubious, in which they may bask and live their lives far from the rude shocks of a wholly objective world.

Not only is imagination itself not banished from the domain of knowledge; it is one of the most precious of its manifestations. Can we tell in what proportion imagination and positive knowledge had to be mixed to make possible the great discoveries of Newton and of Pasteur? What would become of mathematics — lacking which there could be no science — if you were to eliminate imagination? Imagination is quick, knowledge is slow. Imagination flashes above the clouds beams of the ideal that are as beacons of the infinite. Every mariner knows that men are guided by distant lights, but that they should not dash against them.

In general, imagination gives a wider scope to the free impulsions of personality, because its first bound frees it of all control, whereas, on the contrary, experiment prides itself on winning universal acceptance through verification. On the one hand — for we must be frank — ideas based on imagination which require scarcely more than a low average of understanding long resist the attacks of science. On the other hand, ideas based on observation — sometimes quickly evolved as, for example, the laws of Newton — are found to be subject to revision in the light of fresh observation which may bring us new insight. Our scientific certainty will never be more than provisional, for it is always subject to revision. On that fact I base my belief that reality is obviously superior to that subjective truth which, among all the peoples of the earth, manifests itself in dogmas that are called unalterable, but that are contradictory and mutable according to the age and the country.

Thus, perceiving and imagining — two ways of thinking — are excellent means of comprehension for those who can prescribe their relations, and dangerous only for those who take no trouble to control them. We know the world only through the relation between our mechanism and its own, of which we are one of the increasingly sensitive organs. If we perform our normal function, we shall fulfill the just measure of our lives. But if we demand of our complexes more than they will admit of, we shall put the machine

out of order and be like the child who moves the hands of the watch to make the time suit its fancy. The capriciousness of the game makes very hard that accurate foresight which we have the chance of exercising.

Is that equivalent to saying that I should limit myself to contrasting strictly verified facts with the free flight of dreams? No; since dreaming is the organic act of hypothetical anticipation that, by means of yet unverified conjecture, allows us to catch the first idea of an experiment yet to be made. So understood, dreaming is exactly what observing is — merely one of the legitimate forms of thought which, if controlled, result in consolidating our *relative* knowledge. The difficulty lies in avoiding the deceptive quality of appearances, when once we have made ourselves at home in them.

What is it that moves the fœtus in the caul? Dreams, thoughts, or mere irritability of the organs? The transition from sensation to thought is not easy to detect. The first mental effort of the infant released from uterine life, as yet incapable of any form of observation other than successive reflex actions induced by outside contacts, consists in developing autonomous motions, while it awaits the uncertain hour in which chance will bring it its first fragments of empirical knowledge through the first reactions of its sensibility. As it grows older, all that empirical knowledge is consolidated in symbols of personified powers (fables, stories, fairy tales), in which the first metaphysical notions of mythology originate.[1]

At every stage of the animal series sensibility reveals the reactions of mental activity in states that increase in complexity as the organism develops. The reflex is the direct response of organic irritability to outside impressions. At

[1] 'Metaphysics begins where each particular science ends. Now, the sciences are limited to theories and hypotheses. The hypotheses become the material of metaphysics, which, in consequence, is an hypothesis based on hypotheses, a conjecture grafted on conjectures, a work of imagination superimposed on other works of the imagination.' (Th. Ribot, *L'Imagination créatrice.*) The rôle of imagination is distorted when it aspires to escape from the control of observation.

a touch the flower folds its petals, the mimosa its leaflets, the amœba changes its shape by retracting itself. It is the lowest stage in the phenomenon of life. The Brownian movement and the contractibility of the fibrous plasma are well known. As we rise in the organic scale, the activities of transmitted impulses, with their necessary reactions, merge and so form a dim consciousness.

The series of organic differentiations, from which result nerves for transmitting energy, are in themselves fairly good conductors. The chain of neurons (sensory and motor) enlarges the active rôle of the plasma which meets the exterior world with a network of tentacles. Ensues the play of subconscious centers, when the sensory and the motor neurons are supplemented by coördinating neurons. Finally, the conscious centers fall into line. Between the subconscious being and the being whose consciousness is fully formed there is a continuous series, in which the units take their places according to the degree of differentiation in their nervous centers. Thus, the affiliations of the sensorial organs (differential indices) bring about synthetic representations from which flow groups of mental images, resulting in the decisive liberation of the impulse known as 'will.' Subconsciousness and consciousness develop through successive stages until they reach a condition of over-acute consciousness that is pathological in character.

As the result of evolution, consciousness, or the knowledge of things through representation, evolves before our eyes, and we need not go far back in history to find that our modern consciousness, however open to criticism, is better established and more adequately equipped than that of our ancestors. Man, who is wholly made up of the interwoven reflexes of consciousness and subconsciousness, becomes an individual amid increasingly complex and inseparably connected phenomena. It is his Ego, his sensation of personality and of will, which faces the universe to achieve a transient moment of subjective grandeur in the eternal immensity.

Thus man was led to conceive knowledge. But as soon

as he tried to attain knowledge in one leap, ignorant of the fact that he needed long-continued labor merely to enter into the paths of orderly observation, how could he have evolved even a preliminary method of investigation of which he lacked the elements and did not feel the need? It was a formidable enterprise with which the universe confronted him when he first met it, and from which resulted an accumulation of error in which the pick of the diligent miner may now and again strike a nugget of truth.

Thus, to the difficulty of knowing were added the many perils of mistaking, all the more formidable because, if knowledge has elements of uncertainty, error installs itself at once in the 'absolute,' in which the weakness of our relativity is too prone to take refuge. Finally, whereas our experimental 'truth' is purely impersonal, too many of our own weaknesses enter into error for us not to feel sentimentally attached to it. Thence came the pitiless struggle for the sake of 'hypotheses of hypotheses' that stained the earth with blood, whereas the idea never occurred to any one to send men to the stake in order to suppress some particular doctrine — for example, that of the combinations of oxygen — in which, nevertheless, the correct understanding of the universe and of man is implicit.

Be careful, then, not to consider the fundamental aberration that led us to measure the universe by our current means as a simple passing mistake. The apparent 'nature of things' tempts us with blind alleys in which the evolution of knowledge does not permit us to persist. Why should not simple minds, caught in those détours, hesitate when we offer them merely the exacting labors of a provisional 'certainty,' while centuries of presumptuous ignorance magnificently offer them an unchangeable doctrine, adapted to their mental capacity, sustained with the pomps of an infallible priesthood in posts of universal authority?

With all that glory compare the obscure scientist, who without candles, without organs, without hymns, without bedizened Swiss guards, without ceremonies, dared confront the problems of the world under the eye of the Inquisition,

now reduced by evil days to our modest modern 'Congregation of the Index.' The poor man struggled hand to hand with the mysteries of the world, which are harder to penetrate than the arcana of theology, while a metaphysical system of all-work vainly spent itself in interrogating a fantastic Ego, endowed with sublimated life, and equipped to a nicety for the miracles of intuition.

In terms of discovering the world, intuition may be defined as seeking it, not in the images from without, which can deceive only until the imminent rectification comes, but in the miraculous Ego of the metaphysician that is represented to us as independent of this universe, upon which it depends. To reverse the order of phenomena, to seek the conditions of the material world in the immateriality of an unobservable substance — such is the procedure that is suggested to us as superior to scientific observation. It is as if the astronomer were to think that he could see better through heavily smoked spectacles. How could his retina perceive anything but a dark mirror which would reflect all the wavering visions of a disordered imagination? Such were the clouds in which Hamlet uncovered his chimeras to the complaisant eyes of the dumbfounded Polonius.

I am careful to avoid confounding the intuition of the metaphysicians with mathematical intuition, which is no more than a phenomenon of verified imagination. What metaphysical 'intuition' seeks and claims that it finds in man is a reflection of the exterior world beyond what direct observation can reveal. If realized abstraction offers intuition a catchword, like the word 'god,' it will try to make us conclude that we have knowledge of a corresponding reality, and that that knowledge, although it lacks any element of scientific observation, is the proof of the reality of 'divinity.' Such is the intuitive method which tries to demonstrate through fragile words the formation of a universe which it has made subjective.

Mathematicians use the word differently, because, as Henri Poincaré remarks, their doctrine is 'the one which borrows the fewest notions from the exterior world.' In-

deed, it seems that they derive the major part of their science from our imagination, subject to future verification. However, if, as we are told, 'Mathematics consists of giving the same name to different things,' those things must surely be supplied by the exterior world, leaving us the task of studying them under specified aspects.[1] The relations may be such as we can utilize, if experiment can obtain the data. Numbers, values, points, lines, and figures are but representations of facts to which mathematical writing assigns an indeterminate quality suggestive of the absolute. People tell us that Cauchy *spontaneously* conceived a formula proved correct by results; the fact is that he had the good fortune to make a lucky hit, as a chemist or a physicist might have done. How many other hypotheses might he have conceived, and, indeed, how many did he conceive, with quite the opposite luck? There is not a trace of metaphysical intuition in that business; there is no reason in that for calling on personal judgment to justify the universe. That is something which Poincaré quite clearly recognizes when he speaks of 'a sentiment, an intuition of a mathematical kind, that makes us divine concealed harmonies and relations.' What is that, pray, but a lucky shot of constructive imagination?

The most metaphysical of metaphysicians has not yet ventured to propose that we totally disregard our sensations. He has been satisfied to decry them without admitting that except for their relativities life would merely be death. Indeed, what would imagination have left? There would be no room even for its mistakes. It would mean the abolition of all the activities of the Ego, the very name of which would no longer have any excuse for existence. In the confusion of this age of mingled knowledge and misconception, I do not affirm that we need choose between experience and imagination; I only affirm that it is time to give to each of those two eminent assimilating faculties its just share in the work of knowledge.

[1] Mathematics is a language of values; that is, of relations, the signs of which, as in the case of words, produce realizations, but with the difference that the sign necessarily expresses an actual fact.

Our sensations may deceive us? What of it? How can relativity suggest a definition of the absolute? The mere idea is so perfectly preposterous that the feeblest mind would not dare even to express it. Meanwhile, good people constantly rejoice because insufficient observation has deceived us. What of the errors into which uncontrolled imagination has made us fall? Experiment will test experiment with or without the help of imagination, which so often needs to be propped. Wishing to verify experiment by means of what the imagination may hit on is a procedure that the history of religion will not allow us to pursue for long.

What, then, is imagination? Is it the vision, the need that we feel in our reaction against the disappointments caused by what is to decree what might be? It is the marvelous faculty that without effort [1] projects us above the conditions of the world and theoretically gives us the joy of ruling it. I have no wish to speak ill of it. I will even go so far as to admit that it is the loveliest, if not the best, element in our destiny. Pascal, who was unquestionably one of the noblest victims of imagination, poured himself out in invectives against it! 'Mistress of error and falsehood, it deceives the more because it does not always deceive.' Well, yes, it is imagination's business to search beyond the realities on the chance of a lucky anticipation of truth. Did not imagination discover the atom [2] before we actually encountered it? It does not follow that imagination merits the same confidence as does observation. Its errors are beyond reckoning, whereas experiment has, by verification, progressively crystallized itself into an incomparable block of fact.

Since imagination incites us to face the world with optimistic visions until experience comes with its rectifications, its function is quite different from the function of observa-

[1] Without effort, since there is no need of proof, and since nothing is so odious to the man who is content to dodge it as the *onus probandi*.

[2] The same word 'atom' represents two very different things to Epicurus and to Jean Perrin.

tion. For that reason its errors, even when recognized, help us just as mistaken scientific hypotheses have helped us by holding us in, or by leading us back into, the direction of more closely approximate knowledge. What right have we to complain of the extinct ideal which had its day of success, if, in spite of everything, we owe our progress to it? The 'fecund delusion' of the thinker was the potent and decisive herald of the man who was to be. We need not determine which is the better guide. Experiment builds the wide Roman road of knowledge; imagination enables us to travel it.

In an hypothesis of which Ribot reminds us, De Baer has clearly shown that, were the conditions of the sensorial organs which make the world objective changed, our subjectivity would be changed. That is not so great a marvel as it may seem. Of the sheer absolute — supposing the word 'absolute' to have a meaning — we shall never know anything, for the conclusive reason that the instrument fit for getting such knowledge cannot even be conceived. Since we are relative, our observations must be obtained by relative methods. Let us profit by those methods as much as possible, but let us not deny ourselves the relaxation of more or less controlled dreams.

We depend on the world, and the world does not depend on us. We can change nothing in it. Our reports of our experience may provisionally differ; they should always coincide at those points of the cosmic synthesis that express elementary activities. We cannot observe, think, know, or even imagine, except in proportion to our allotted capacity. Let us, then, boldly take full advantage of every impulse to test things in all conceivable ways. None of our tests prove that there is any difference between the action of the Cosmos and that of human knowledge — its product. That is so true that, without any revelation of the absolute, we shall always be brought back to syntheses of positive interferences inseparably bound together. Basing our theory on that truth, we can continue to test our tests and so get a sufficient approximation of truth. At long range one must aim high if one is to hit the target.

Our metaphysicians, whom nothing frightens, explain all mysteries by the greater mystery of primordial principles, of essences, of entities, and of other quiddities, all of them forms of a certain transcendentalism, the magic virtue of which is to explain everything by vocal sounds that mean nothing definite. It is like opium that induces sleep by its 'dormitive power.' Mere tautology. Thus, simultaneously with the first wail of ignorance, metaphysics was born in a thousand forms, assuming the shape of an explanation which consists in answering the question by eliminating the question mark. To explain a movement by a power which causes it to move is a *petitio principi*; it amounts to answering a question with the question itself.

To sum up: to imagine is to build outside sensual reality subjective figures supposedly objective. Since that amounts merely to explaining the data by means of some fiction, the most superficial 'observation' is enough. To observe is always to build images, but images the contours of which are attached to the notations of our sensibility. Whence it follows that the decisive effort is to *look*, to *contemplate*. India did not hesitate to identify looking with knowing. The Sanscrit root *Vid* (reappearing in the Latin *videre*, 'to see') gives *vidya*, 'knowledge,' from which, with the help of the privative *a*, comes *avidya*, 'ignorance.' To contemplate and to observe may be said to be equivalent terms. We must begin by opening our eyes.

Yes, but what is the result of that contemplation? According as the observers differ, so will their explanations differ, for even when we adhere to scientific formulæ, appearances are what strike us first. Such is the appearance of the stick which, seen through water, seems broken — an illusion that observation must correct. Continuous observation is the test of momentary observation. Imagination is slower in correcting its first free steps. The metaphysical entities, which people the world with existences that have no reality other than the sound of the voice that utters them, are as tenacious of life as the dogmas of theology. They are even more tenacious, since they have cast off the rude ap-

parel of the primitive days and substituted for it the refinements of a pedagogic subtlety.

If we go to the bottom of that need for thinking metaphysically which is inborn in many men of superior ingenuity of mind, we find in it the effect of the contrast between human personality and the necessary impersonality of the infinite universe. That is what brought about the spontaneous confidence which primitive man had in the mysteries of theologians, the metaphysics of which is no more than an anæmic refinement. Theology, at least, is based on 'divine authority.' Metaphysics is based on thin air.[1] We can only leave it there.

ARTICULATE SPEECH

In order to stay on solid ground and to proceed on it according to the laws of organic evolution, the study of the power of imagination and of observation in animals is first of all requisite. We know that the existence of articulated language, through the flexibility of its symbols, opened an incomparable approach to higher comprehension. That does not affect the necessity of going back to the source if we wish to ascertain the first aspects of the phenomenon.

The sensations of the animal are obviously of the same order as our own, and until speaking man appeared the power to associate sensations seems to have been the same in animals as in man. The mental images of the two could and should differ according to the delicacy of their senses and according to their fumbling attempts at more or less rudimentary explanations. In any case the ratios of their respective sensations had not the same coördination, since, even if certain animals are not provided with some supplementary senses, in many of them the sense of sight, of smell, of hearing, and of touch may be much more intense and much more acute than in man. Migratory birds accomplish journeys on which we should become lost. On the

[1] In order to conform at all hazards with the facts established by experiment, Bergson, renovator of metaphysics, is reduced to extolling evolution with all the animation of a grave-digger.

other hand, the bee, confused by a slight displacement of its hive, shows that its sense of locality is inferior to ours.

No one will dispute that the elementary power of observation, whether inferior or superior to that of man, is the primary basis of animal life. 'A scalded cat is afraid of cold water.' What more convincing proof could one find of the effects of experience? Language multiplied and refined beyond comparison the coördinations of human intelligence within the limits of evolution. For lack of linguistic development, the animal showed no sign of religious feeling, since that is a stage of mental progress to which inadequately gifted organisms cannot attain.

Does that mean that animals have no imagination? No one could maintain it. Interpreting sensation by associating mental images is the work of imagination, especially of imagination roused to activity by the reactions of sensibility in contact with the exterior world. A dreaming dog utters a muffled bark as he pursues an imaginary prey and shows very clearly the play of sham coördinations. A cat playing with a mouse and the mimic combats of young animals have an obvious significance. The hen that turns her eggs seeks an even distribution of heat among her brood. The spider that lays its trap combines in an almost miraculous way the art of observing and that of imagining. So does the fox that outwits the trapper. Down to the humble fish there is no animal that is not sometimes capable of feigning indifference to a bait. My little Scotch terrier does not like bread and rejects all that I can offer her, whether soft part or crust. But if I toss some bits to the friendly blackbird on my lawn, the dog runs to it and eats it eagerly. She wants the bread because some one else does. Isn't that human?

If animals can display a mental initiative like man's in order to preserve and develop themselves, it is because the law of evolution imposes a sequence of means to accomplish a sequence of results. Transferred from animal to man, observation and imagination, thanks to the associative power of language, acquired a different capacity for penetration but remained the common phenomenon at the base of all

growing power of thought. Without the articulations of the voice, animal thought could be only a succession of insufficiently coördinated images. 'Language and thought are inseparable,' Müller justly writes. 'We think in names,' Hegel had already said. Language gives us the power to think accurately.

'What is your fate?' asks Mercury of Sosia.

'To be man and to talk.'

Meanwhile, as we have seen in that phenomenon of error, the realized abstraction, the more we developed language, the more formidable became the danger of deviations of thought.

The association, dissociation, and generalization of sensorial images are states of psychic reaction that cannot be achieved except by means of vocal signs which provoke all the activities of thought and which give them their character. They mark the transition from animal psychism to human mentality. Articulations of thought result from articulations of sounds. 'The need creates the organ,' apparently signifies that the combined effort which is the natural response to the need that is to be satisfied does not cease in the development of the organism until the need is met.

From the need of expression shown by gesture came cries intended to make that expression more definite — cries which, varying in kind, sharpened or softened the echoes of the inner sensation. Our remote ancestors and their descendants collected, increased, and, to the point at which we find it to-day, developed the legacy of these muscular acts intended to express different emotions.

The better to isolate man from his animal ancestor that observation required us to study in connection with ourselves, the metaphysician had to make a distinction between the soul and the mental manifestations of the animal. Descartes tries turning the animal into a machine. Our metaphysics was content to accord the animal a kind of *sub*-soul that it named 'instinct.' The mere coining of a word! Metaphysicians are not niggardly with words.

Their whole 'science' is nothing but words which correspond to no objective fact.

The first being that truly had a right to the title of 'man' was a super-pithecanthropus who tried to talk. This is the appropriate time to mention the fact, for my subject is that empirical putting together of language which awakened and developed the power to think. What thought without words can give we plainly observe in the animal, whose eyes say eloquently enough that feelings and wishes are seeking an expression in spite, so to speak, of disconnected wires.

Every animal has its calls, its cries of love, anger, pain, and joy. The bird pours itself out in melodies. We may well ask ourselves whether the first human words were not something in the nature of a song. The mocking-bird has a flexibility of modulation in the exercise of which it seems to delight; seeking to imitate pleases it more than emitting its own notes. At the other end of the evolved series, our exclamations, our onomatopœias, our oaths lacking any precise significance, offer us perhaps no more than a reminder of the inarticulate sounds that originally expressed the primitive emotions which articulation later made precise.

No one denies that languages are the result of organic evolution.[1] Daily we hear popular expressions which, under the indolent control of academies, cause the evolution of language. Grammar developed only to stabilize and to put in order our empirical acquisitions. It should not surprise us to find that in all tongues like sensations produced like expressions.

Without straying into the bypaths of a complicated psychology, I will remind the reader that sensation reduces itself to a state of nervous vibration which, thanks to the vehicle of the image, the product of accumulated repetitions of organic sensation, results in the manifestation of consciousness. By distinguishing images the vocal signs allow

[1] A fact to be noted is that the theological miracle of human thought cannot be realized except through the long development, brought about by evolution, of an animal organism into a human organism, without the apparent arrival at any particular moment of any entity.

us to classify and to systematize the representations of the senses. Like abstraction, association of dissociated images, by expressing every subtle relation between them, infinitely extends the range of mental activity.

On the history of the formation of language we have a very fine and abundant literature, fertile in profound discussions. It does not seem to me, however, that the reaction of the word on the development of thought[1] has been sufficiently studied. Philology is an experimental science which has already sunk strong roots. Psychology (etymologically, the science of the soul, which is likened to a breath) from the outset lost itself in barren metaphysics. Many persons have tried to introduce into it scientific methods, and sometimes have partially succeeded. So long as we limit ourselves to the play of abstractions, which are all too quick to turn us from objective organic phenomena, the field of knowledge cannot be illuminated. Where would our general views of pathology be, were it not for the insight we derive from anatomy, physiology, and comparative pathology?

However persistently the study of cerebral functions has been pushed, it is not much more advanced than it was when the first autopsies were made. Our knowledge of anatomy has become much more exact. But, as regards the relation of the organ to psychic action, we have scarcely gone beyond tentative guesses.

Until the present time pathology has been of more assistance than anything else. Among investigators of the first rank, Broca, arguing from recognized lesions, believed himself able to fix the seat of the faculty of language in the third left-hand frontal convolution. But Dr. Pierre Marie seems

[1] The word '*penser*' (think) means to 'measure' (Sanscrit, 'man,' which has come down to us as the designation of the human race), which apparently indicates a yardstick, a judgment, of sensations and of the interpretations of them. On the other hand, the word '*parler*' (speak), in which the word '*parabole*' (parable, allegory) is again found, clearly implies a transference of the idea to the proper verbal forms. Thus, as is actually the case with children and savages, it seems that the first conversations of primitive men may have consisted of fables and allegories, and that consequently '*parler*' (speak) was equivalent to '*conter*' (relate).

to have completely refuted that theory. Is there, indeed, any 'sensorial center of language'? No one knows. Dr. Marie shows why Broca's contention was hasty. By exact observations he established the fact that men can speak without difficulty when the third left-hand frontal convolution is destroyed, and that there are cases of 'Broca aphasia' where there is no lesion in that organ. 'The third left-hand frontal convolution,' he concludes, 'plays no special rôle in the function of language.'[1]

The problem is so complex that the question of any localization, more or less ingeniously pursued, would, perhaps, be the least of its difficulties. As a first step should we not seek the connections of the different sensorial apparatus that generate a complex of reactions in the labyrinth of cerebral transmissions? And how could we advance the science of thinking man, if we do not admit that it is certainly founded on the study of the earlier processes and of the earlier mentalities from which it is derived? Through future research in the field of comparative psychology into the development of related organs, generalizations and abstractions, quick to outstrip science, will recover their high cogitative value and will not again slip into the old aberrations.

The development of words has been made the subject of numerous investigations, whereas their profound reactions on the activities of the intelligence have, for reasons easy to understand, been too often neglected. The reason lies in the unlucky adventure of realized abstraction. Within the limits of that which, psychologically speaking, determines the articulate voice, the greatest obstacle to our analysis results from the necessity — if we are to understand the matter — of classifying phenomena into purely subjective divisions, which we create for our convenience in making abstractions.[2] Verbal signs permit us to make permanent those

[1] *Traité de pathologie médicale et de thérapeutique appliquée. Neurologie*, vol. I. *Revue française de médecine et de chirurgie*, nos. 3, 4, 9.

[2] That is what led Cuvier to claim a separate creation for each species considered as a unit.

compartments of thought in which the subjective association or dissociation of images that represent elementary objectivities allow us to coördinate mental states.

Animal cerebration, even in its highest degrees, cannot rise to the level of such organic activity. And as knowledge exists only through the classifying of coördinations, we see the most intelligent beast stop short at matters thoroughly clear to us. What can we say of the sensations of which our relative understanding, so profoundly strengthened by the advent of language, is made up, if we begin the study of it without reference to the first evolutionary stages of life? Just where are we to find the phenomenon of ideation, which is the forming of the idea; that is, a representation of associated images which induce in us an effort of assimilation? The correct ordering of the coördinations of our sensibility requires the analysis of complexes of transient sensation, the sequence of which makes our mental state.

Metaphysics was bound to disfigure the phenomenon by attributing an objective reality to ideas, as Plato would have it. The Middle Ages raised a great to-do over Plato's doctrine, and it remained in vogue among the last survivors of his school. To-day we can no longer see in ideas anything except the effect of organic activities, the connections of which are determined by our cerebral switch-board. The coherence of organic phenomena and of their mental products seemed for a long time a fact so much to be dreaded that in order to escape it Descartes painfully spent himself on a puerile mechanistic philosophy that could not stand debate. All that the metaphysician of to-day dares do is either to distort the legitimate induction or to avoid it.

Biological law decrees that the intellectual development of the infant, from its birth to its first onomatopœia, shall follow the same course of evolution as that of the successive animal minds. Linked sensations indicate, or even describe accurately, the needs, the desires, the resolutions that must be satisfied. Relations are established between gesture or monosyllabic utterance and the satisfactions which they obtain. Thus, guideposts are set up that, in-

creasing in number and falling into orderly arrangement, come to stake out the course of memory, in which transient analyses strive to become permanent. In that manner associations of more or less clear images grow definite and serve as more or less precise representations of ideas; and, behold, the intellectual process has started on its way! For soon the gestures, the onomatopœias, the different cries expressing every emotion, will multiply, differentiate, and gain new accents in an infinite gamut of graduated expressions. Look at the familiarity so often existing between the domestic animal and the child who, although both are unable to articulate, so quickly understand each other.

Nevertheless, because of the discrepancy in their respective capacities to express themselves, divergences are bound to occur. Like us, animals think deductively — the proof is visible in all their actions — but they think through associating guideposts that do not include the symbols of language, and that, because they are inferior to ours, cannot bring animals to an equality with us. Again, good deductive thinking depends on sensorial gifts suitable for accomplishing a predetermined plan. Certain species — as I have already said — have senses, and, consequently, abilities, which we lack. Of that there is no doubt. With all our knowledge we should be much embarrassed to travel the distance of a migratory swallow, or to make an oriole's or a goldfinch's nest properly.

Finding out what elements must be brought together for coherent achievement results in setting up a nascent personality that can be developed by training the reflexes. The same thing is true of the child, which begins to display its will by means of gestures and cries until it hits on its first treasure-trove of onomatopœia that later leads to articulate speech. The evolution of child and of animal respectively are identical up to the point at which, the limitations of one yielding before the ambition of the other, emotional power determines destiny. The animal can modulate sounds but, unlike man, cannot articulate them. By means of these modulations of sound, capable of expressing the dominating

forms of emotion, man came to utter finely differentiated communications. Thus in a thousand ways the child contrives to devise rhythms of sound in order to express those sentiments and to evoke those responses which it requires.

The animal can complete its modulations with songs,[1] and every one knows what themes of musical expression the birds can produce. Music and articulate speech are two marvelous means of expression; one less precise but evoking the highest emotional resonances; the other more rigid but, by means of complexes of sensations, capable of giving form to thoughts that it isolates from the mass in order to subject them to those comparisons from which ideas are born. Knowledge cannot receive definite form from music. Sentiment cannot be so completely expressed by word as by music, the subtle shades of which delight us. The alliance of music and articulate speech leads us to the finest achievement of emotional art of which man can dream.

Meanwhile, in the presence of the lark, the nightingale, or the warbler, we remain as much at a loss as do the human beings who, not speaking the same language, no more understand one another than they know how to interpret what the bird abundantly expresses in its own tongue. The parrot, the starling, and the bullfinch reproduce our articulated words without attaching any meaning to them.[2] They are moved by the simple need of imitation which is at the root of onomatopœia; this is attested in India by the delicate metallic sonorities of the blacksmith-bird, which reproduces with deceptive accuracy the tinkle of the light jeweler's mallet on a little silver anvil.

To sum up: accompanied by gestures, cries, songs, and articulate sounds that establish a bond between sensations

[1] The so delicately varied note of the tree-toad passes through all the musical grades of emotion, whereas the peaceful frog expatiates in discords that, though so different from the note of the tree-toad, are probably no less full of meaning.

[2] Even that is not certain. In my native village I knew of a bullfinch that when any one entered the shed of its master, who was a maker of wooden shoes, said and repeated as it hopped about: 'There is some one in the shop.' The bird certainly had the necessary association between the entrance of a stranger and the need of announcing the fact.

and the signs that express them, ideas take shape in the form of connected representations. The reflexes, however, which in the case of the groping crowd take the place of primitive cogitation, condemned the first men to be content with the obscure, unconscious impulses which, attributed to cosmic energies, found themselves deified through what Müller calls a 'disease of words,' but which it seems simpler to interpret as a mere organic aberration of the subjective self.

Indeed, it is merely a phase of evolution which according to human measure was very long, since it called for a period of centuries, but which in the infinity of the Cosmos has merely the value of one pulse-beat of eternity. Knowledge and error come from words, which although purely subjective, permit sensations to be associated, but lead us astray when appearances induce us to give them objective reality. Sooner or later the exaltations of imaginative ignorance were bound to give way before the fruitful labors of positive science.

When the metaphysician, wallowing in his verbalism, triumphantly offers us the products he has fabricated — soul, spirit, divinity — free of all cosmic dependence and subject to no cosmic conditions, we can see in him only the presumptuous employer of words made into fetishes. In his inadequacy he attributes real life to verbal sounds — a proceeding that enables him to dispense with all objective research, whereas the labor of ages is needed to discover that words are simply the subjective expression of the organic synthesis, the effects of which make us what we are.

As a synthesis of the absolute, the word 'god' has no other origin than a purely subjective conception of universal objectivity, easy to talk of, impossible to make alive. Those respectable folk who would like to find an immediate triumph in our failures do not recognize that the worst failure is believing that in virtue of a sound they know what they do not know. The reason is that it is easier to express the inexpressible in ways which are artificial, and which consequently may be deceptive, than to make that inex-

pressible appear at the bar of our intellect and to demonstrate our ability to question it by experimental methods.

ADAPTATION OF WORDS TO THOUGHTS

In the torrential flow of successive or simultaneous sensation, association and dissociation (or abstraction) are the two principal elements in the general phenomenon. No one can question the fact that animals have an incipient power of association. But abstraction (purely imaginative in origin), which detaches a sensation from the mass and isolates it by means of an evocative word, confers on it a schematic individuality for the purpose of building up verbal relationships. All mathematics, without which there could be no science, consists of generalization that has been pushed to the point of abstraction in the expectation of finding some objective fact to correspond with it. Similarly, the language of mathematics consists of conventional algebraic symbols that subjectively provide us with objective solutions. As I have already said, we know very well that there exists no *a*, no *b*, no *x*. Nevertheless, *a*, *b*, *x*, and all other congeneric names of hypothetical values, lead us to definite conclusions which we can apply to objects.[1]

The difference is that one is a system elaborated for the purpose of calculation, and the other is one in which the voice, whether articulate or not, is the natural echo which expresses the organic spontaneity of the reactions. Through the verbal liberation of images fictitiously dissociated, man alone attains a power of analysis the delicacy of which gives him access to new profundities of relationship. Thus, abstraction — imaginative activity — installs in us the phenomena of that higher evolution which makes thinking man.

The higher the ascent the more dangerous the fall. The abstract word that fixes with a vocal sign a fictitiously detached property of a sensorial image — whiteness, bene-

[1] When, instead of *a*, *b*, and *x*, our primitive ancestors found themselves faced with unknown (unnamed) elementary activities, the name did not lag far behind, any more than did the entity. I demonstrated the fact in the chapter on 'Men and Gods.'

volence, justice — would fatally tend to prolong and to stabilize the fictitiously objective name and to make it more independent of the very sensations in which it originated. It is a natural accessory of language which, using a word to dissociate one property of the sensorial image from the others in order to distinguish the subtle interplay of relations, necessarily tends, through the facilities of speech, to complete the materialization that it began. That is the *realized abstraction*[1] which is the mother of that divinity of whom it is said that we have the conception because we *call it by name* — something very different from making it live. It is this training in nimbleness of the sensorial interpretations, artificially pigeonholed by means of language, that gives such life to our words as to carry them outside ourselves. For that reason man, infatuated with the excellence of the mechanism by which he separates himself from reality in order the better to discover it, finds that he himself is the innocent maker of the divine entity.

In this picture there is no room for the miracle of 'innate ideas,' or for that much overrated 'intuition,' both phantoms of metaphysics, which, wishing to unveil phenomena, go no farther than fabricating sounds. Words are Pandora's box. In them are contained the good and evil fortune of man. Æsop denounced them in a celebrated apologue. Yet he knew neither the grandeurs nor the embarrassments of realized abstraction, maker of good gods and of bad. Inseparable from its social environment, our life finds itself obliged to base doctrines on appearances and then by successive rectifications to develop a decisive contact with reality. It is incoherent in its attempt to be coherent.

Of all the original misconceptions, the hypothesis of divinity, which at first seems so simple, is the one which could be expected to survive longest by reason of the puerile charm attached to blind submission to the universal autocracy of the interests which it supports.[2] Conjectures of the

[1] Before Locke, Voltaire expressly pointed out this error.

[2] In the same manner our absolute monarchies were installed in the social order. Though now superannuated, they were beyond doubt formerly a notable

imagination, our hypotheses, having a basis of fact more or less solidly supported by appearances, or even by progressive observation, succeed one another in turn, only to leave us approximations of knowledge that cannot be joined to the antique keystone of divinity, an arch which rests on a crumbling foundation.

On the day when man became capable of verifying his hasty observation, scientific knowledge stepped upon the scene, and the debate began between what we can say and what we can experimentally prove. Knowledge of the absolute defines itself as final, as being as incapable of retrogressing as of progressing. Scientific knowledge, recognized as relative, errs, falls, rises, only to grope its way, undaunted by failures, among the errors that lead to coördinated truth. Dogma undertook to unify human thought. It was, and still is, the source of the deepest anguish of sorrowing man. In contrast, the approximate truth of relative knowledge unites all men in a unanimous obligatory assent.

Independently of primitive aberrations, the correct concurrent evolution of word and of thought continued on its obscure course. We can follow the evolutionary formations of the French language, which is relatively modern, together with the corresponding progress in thought that from day to day establishes its provisionally permanent results.[1]

The supple forms of modern language bear the same relation to the primitive sound-formations as the chipped flint of the quaternary age to our machine-tool steel. A paleontology of language would discover in fossil-words a linguistic reconstruction of bygone ages. Imagination tempered with observation in more or less faithful expressions,

improvement over the incessantly disintegrating groups formed as a result of our natural gregariousness. To-day we rise and fall tumultuously, and will so rise and fall for an unknown number of centuries, in an era of disorderly oligarchies.

[1] Such is the history of more or less felicitous neologisms, now become innumerable, and of promptly popularized extensions of sense. See the gaps which, in only fifty years' time, have appeared in Littré's dictionary, which still remains an admirable work.

gave existence to articulate sound for human use and made a like effort in preparing the crude instrument of fashioned stone on the model of the natural splinter picked up by chance. Perhaps there we can discover man's first surprised start when confronted with his own thought. If a certified record of the fact could have been made, how we should have valued it!

On the relations between words and ideas, which evolution never stops refining, men could write books and indeed have written them. I think what to-day we must remember is that since the vagueness of the first lineaments of the idea carried with it as a necessary consequence the more or less faulty approximations of its verbal mould, the later form often extended the original sense, to which it was frequently unable to limit itself. The translator, promptly accused of falsification, quickly finds out that truth.[1]

But along with that inevitable defect, how can we fail to observe the general adaptation of the inflections of the voice, which in all languages correspond to the organic formation of thought? The idea and its representation, which are parallel products of the same organisms, should approximately coincide. By their great power of expression, words, which contain all the relations of thought, came to rule human society. Why is it inevitable that no victorious achievement fails to result in some temptation to abuse it?

Abstraction, which detaches a particular sensation from a complex of sensations in order to fix it as an idea in the sound of a word, produces subtle articulations of thought necessarily unknown to the animal, embarrassed as it is by an agglomeration of sensations which it cannot disentangle. On the other hand, if articulate speech, which permits every flexibility of thought, is so loose as to liberate the verbal phenomenon in a blast of unrestrained imagination, we find words, lacking all counterpoise of objective reality, sailing away like toy balloons with broken strings and assuming among the clouds the form of entities and divinities that, like the gods of the 'Iliad,' will again descend to the

[1] Tradutore, Tradittore = Translator, Traitor.

earth to take part in human conflicts. Only scientific knowledge can bring about a durable peace between man and his gods.

THE FORMS OF KNOWLEDGE

Science must in the long run pass judgment on knowledge. Observation, conjecture, and verification form, according to Ribot, the three successive stages of the phenomenon. Since verification is only a new form of observation applied to the testing of a conjecture sprung from imagination, the whole operation reduces itself to two terms, observation and imagination, which, as it were, seek the oscillatory equilibrium of a pair of scales between two opposing states of mind.

To which of the two should we give precedence? 'Before civilization, man was purely of the imaginative type,' further declares Ribot. That plainly means that among primitive men imagination was much more valued than observation — which is not hard to understand, since it is easier to take your chance with a conjecture than to observe precisely. It is no less plain that man cannot imagine without putting together appearances, which implies that he has looked to poor purpose, but that he has looked. That is why, as I have already remarked, the representations of 'monsters' are never anything except reality deformed.

Inadequate, that is, misinterpreted, observation is the first step forward, and since at the start interpretation can only be that of a vacillating imagination, it is not surprising that it made a false start. The evil was sooner or later to be repaired and compensated for by subsequent accomplishments.

I have described the coördinations of the interpretations of animal experience. They come to an abrupt stop for lack of a sufficiently well-equipped imagination. From speech (very deceptive at times) the development in man of the power of association, of generalization, of abstraction, and of metaphor were to produce fresh notions about the phenomenon, at the same time that imagination, en-

larging the circle of its flight, was irresistibly to tempt us with the easy access to other regions than those of reality. Thus, not only was hypothesis to outrun observation and even to offer to direct it, but the tension of unbridled idealism, metaphysically declared to be 'transcendent,' that is, inaccessible, was to animate man with an incomparable emotion and determine the great manifestations of his life.[1]

It is obvious that the imaginative man would want at a single stroke to excel the scientific man, and that he would aspire to nothing less than finding the explanation of the universe in man himself. We sometimes find our sensorial processes untrustworthy, and if we argue that for the purpose of checking our verifications we can trust them mutually to correct one another, the quick retort is that they only supply us with some phase of ourselves, and that they never reveal to us anything about existence in itself. By such arguments metaphysics proceeds, but does not tell us how we can so isolate human conditions from the world as to confer on man the ability to decide.

As if it were conceivable that man, a product of the world, could be anything but an incident of cosmic development, with which, in his entirety, he must harmonize, metaphysicians even ask themselves in all seriousness why the world should be rational, that is, consistent with the facts of our intellectual development. What can change the phenomenon of consciousness, which we see come to birth and evolve in that living series where we can discover nothing except links of the universal chain? In aspiring to light the universe with our candle in order to know existence in itself — that is, the cause without a cause, not to mention the absurdity of an ultimate that contradicts the universal correlation of the Cosmos — I see nothing more than giving its head to a chimera of the unbridled imagination. By that I mean celebrating with resounding blasts of the horn

[1] Montesquieu says: 'A touch of folly never hurt anything.' Even so, the navigator should not pitch his compass overboard, since sooner or later he will be obliged to have recourse to the needle — whether it points in the direction he wants it to or not.

the view-halloo of knowledge when nothing else happens to the pursuer than being finally killed by the pursued.

Primitive subconsciousness, simple animal 'knowledge,' evolving throughout the ages, knocked about between the incoherences of an uncertain observation and imagination, and staking its fortune on flights of the articulate word, more willingly yields to the emotion aroused by rudimentary poetry than to the sober prose of verification. Systems of theology and of metaphysics assert at the start that they have *found*. The man who wishes to know will understand that he cannot exhaust the stock of eventual discoveries, and that there is no sure method of obtaining knowledge except through unceasing search. Theology condemns itself by claiming the last word concerning the human mind.

ROUNDING THE CAPE

Between night and day, between the man who knows or knows imperfectly and the man who is in the way of knowing, the gap is immeasurable. To be or not to be; to remain without form and without voice before the impenetrable rock that will not open, or to hold in our hands the magic key to the mystery; to be the beast or the angel of Pascal; to be dead or alive; to renounce action for lack of knowing how to enter upon it, or to put yourself resolutely on the march toward the phantom of the unknown that flees on the horizon — such are our alternatives. Ignorance is weakness. Knowledge is power. Meanwhile, if we wish to take the correct measure of our knowledge, we must neither let ourselves be dazzled by it, nor should we despise it. To know enough of the world and of yourself to systematize your thoughts; to rule your emotions; honestly to direct your personal actions, and to contribute your just share to the social activities of an harmonious altruism — that cannot be learned from the man who feels himself lost on the earth. On the other hand, the pilgrim who has blazed his own trail can advance with confidence.

I said *can* because action demands the exercise of will power, as well as the necessary ability to act. Knowledge

can powerfully help in determining character, but will not induce action without the help of emotions. Joan of Arc, although ignorant, attained to sublime heroism because she surrendered herself to a flood of right emotion which leapt from her own heart without the need of any suggestion from knowledge. The eminent thinker, Bacon, yielded to the temptation of money. I do not conclude from the two cases that it is necessary to commend ignorance or to shut the till when a scholar calls. I simply say that the force of our higher emotions decides how we shall employ our lives, and that knowledge constitutes the potential of the activities in which more or less competently we are to engage.

Terrified at the growth of scientific knowledge, the dogmatics rally us on our acquired 'science,' which being open to suspicion cannot always be safely utilized, whereas they themselves sum up the whole action of the universe in a single magic word, under the dominion of which the whole company of our accumulated errors is displayed. That, indeed, is what keeps us so far apart. They have a *word* for the whole of knowledge, whereas we take pride in limiting ourselves to contact with actual fact. Their 'Absolute' provides for everything, provided we give it the margin of another life, for on earth there is too much contradiction between its promises and the extent to which it realizes them.

But how can we grasp the absolute except through personal experience? It is true that our knowledge — an encounter of moving waves in perpetual flux — demands successive hypotheses open to every rectification. Our subjectivity requires them. What, then, is the value of absolute and 'eternal' divinities who vary from century to century and from land to land? Organic necessity forces on you this procedure of contradictory affirmations at the very moment when you spurn it. The fact is that in spite of everything human relativity holds man in its grip. How can you explain why, in contrast with observation that, when properly verified, meets no contradiction, one and all of the discoverers of the absolute repudiate each the

other's treasure-trove of gods, who excommunicate one another?

In that general state of mind, derived from every sort of source, we are invited to the sumptuous parades of ignorant emotions, regulated by the authority of some and the submission of all. Our effort will be retarded, but not nullified. We must forge and erect kinds of character capable of putting the individual in possession of himself, so that he may reach a moral greatness in which the best of him can be developed. For nothing in human civilization will improve except through the improvement of the individual along the line of scientific knowledge, which is the permanent source of the finest elements of our personalities.[1]

The progress of the experimental method is the marvel of the age. Theologians and metaphysicians refuse to recognize it because they wish objective knowledge to go 'bankrupt,' in spite of the fact that no man can help using it, even though he trusts to the chances of an irresponsible dream for his religious generalizations. The high priests of metaphysics, forced against their will to come to terms with 'bankrupt science,'[2] could afford to run the risk of admitting, purely as a matter of form, a doctrine of evolution. Any one can foresee what will probably remain of it in such hands as theirs.

Bankruptcy of science — it is an appropriate time to find out just what that phrase means. In order to declare that revelation alone can enlighten our intelligence, and that experimental observation can bring no comforting knowledge, a man must have an organism which, like the fossil frag-

[1] In that respect, the Chinese anticipated all other thinkers, for they established as the point of the supreme attack the discovery of the 'Way.' (Tao.)

[2] Henri Poincaré, addressing himself to 'people of the world,' who are more tractable than the clergy, sets himself to prove by a long series of examples that superseded scientific explanations are broken up into material that can be used for future constructions, and that are even necessary until the day when new developments in experimental science again demand new forms of interpretation. On this point I cannot do better than refer the reader to *La science et l'hypothèse*, chapter X, where he will see in the succession of theories how new developments become incorporated in the ancient foundations. Not only is no error useless, but even its origin may give us a better insight into truth.

ments moulded in the lime of our beaches, lies petrified in the mud of ages. There are two means of 'knowing': one, bare of all apparatus of scientific proof, supporting a bare affirmation by a series of other affirmations that come down from an age when no experimental proof could be conceived; the other, the product of a severe training in experimentation applied to seeking formulæ of knowledge only through rigorous methods of tried and tested observation. Is there any 'bankruptcy of experimental science' merely because, since our understanding is only relative, all our accumulated proof and counterproof leave many fields of the unknown unexplored? On what basis and on what authority is the failure of science proclaimed? The failure of scientific proof reached through human intelligence is asserted by precisely those persons who do not dare to give it a chance to establish itself. And because they bring us no method of verification, their impotent testimony is expected to triumph over carefully checked observation.

The quite simple fact is that God and his angels have not yet been 'observed.' We are of course told that they have shown themselves to seers who have testified, but who find themselves without any means of proof. Naturally, I admit that a burning bush, a voice, and water gushing from a rock are 'proof' enough for Moses. But scientific proof is proof only when it can be established for every one at every time. Is that what constitutes its 'failure'? A man who is believed to be dead, but who is not, proves nothing, except that the fact of his death had not been adequately verified.

Accordingly, in contrast to scientific proof, which remains permanent, an indefinite succession of 'miracles' was necessary to prove — and in what roundabout ways — the intervention of a divinity who at any moment could all the more fittingly have shown himself because he could have had no reason for hiding. Is a miracle, as is generally the case, something that apparently reverses the laws of nature? The man of science sees in it only a call to fresh investigation. A falling stone is as great a 'miracle' as would be a stone that rose by its own initiative. Everything is 'miraculous,'

or nothing is; and the exposure of 'miracles' is a task that we have continually to begin over again. Are Marie Alacoque and Bernadette Soubirous as good judges of phenomena as an observer who, as a matter of method, insists on eliminating every chance of mistake that he may so fortify the whole experiment in its most minute detail as to make it fully convincing? Is he to take all that trouble only to be told by people who cannot show a shadow of experimental proof to support their affirmations that knowledge, carefully checked by all the men of science in the world and also by current application, is an irreparable illusion? In vain do we report the details of every experiment. Bernadette Soubirous in the depths of her monastery where no one can question her escapes the necessity of explaining her 'miracle.' The crowd runs to Lourdes, and the man of science sees himself shamed. Is not the fact that so many minds can be misled the miracle of miracles?

To those poor souls who, in order to contrast man's science with 'infallible' Revelation, the possessor of absolute truth, complain that it is only relative, it would be well to point out that, were it not for our relative knowledge, no trace of our personality would remain; and also that our very inadequacies are the foundation on which rests the dignity of our lives. Let us admit that by some impossible chance the relative can perhaps be assimilated with the absolute, and that all that is unknown in the world may magically become known to us. In that case there would be no human mind, for in intelligence we should be gods. And if our self-styled deists were capable of delineating their divinity, they would know that the first definition of the 'infinite' would be a perfection so exactly balanced as to be immobile. If the subjective god of our imagination could be set up as an objective reality, he would find that he had no motive for doing anything, since he lacked nothing. That did not embarrass the first worshipers of fetishes, for they conceived their gods in total ignorance, just as they were to bequeath them to our grandiloquent logicians.

Without undertaking a too formidable analysis, let us be content to take man as cosmic phenomena have given him to us. What does he know of the universe? One person tells us that he knows everything, because some one who has learned nothing from experience has told it to him 'authoritatively.' Another person, not content with a vain absolute, puts his confidence in that observation of things which shows him activities to be linked up in tentative syntheses capable of being verified. And in return he is told by those who know everything without having made an effort that he knows nothing, and that he can never know anything. Meanwhile, the persistent investigator continues to collect his experimental data in order to build edifices of knowledge undreamt of by him who pretends to know everything. And so the two protagonists continue to confront each other; one, unable to do anything but be eternally at his magic rites, since for him there can be no advance in knowledge; the other, daily advancing in definite information about the universe, scientific proof of which he continually offers.

Let us assume that through the efforts of unnumbered centuries all our relative knowledge, with nothing lacking, had coalesced into a block of absolute knowledge. After such a monstrous meeting with the infinite what would be the state of finite man? Where would he find a field for new conquest open both to his experimental researches and to the flights of his imagination? The wretched creature would know everything and could no longer return to the magnificent efforts of the time when he sought what it was his misfortune to have found. He would have no reason for thinking, for willing, or for doing. Behold him, forever diffused, sunk forever in the inertia of potential powers that no longer can be set free.

In the ages when man could cheerfully complain of the achievements of his relativity, the imperious need of knowing had impelled him to the efforts of life, and had given him, along with the ardor that sprang from the liberty he required, the superior contentment of a personal dignity

susceptible of increase through his own endeavor. Such an advance in nobility is not only the finest part of actual man; it is still, and above all, the inexhaustible source of every one of his potential activities. His greatness consists in a tense desire to know. What would he do with himself if he had found out everything? His value lay not only in his ability to know, but in the irresistible impulse that urged him unceasingly toward the conquest of the unknown. In the efforts of intelligence error itself has its poetry. As soon as ambition to grow is lost, gone is the ideal of realizing human possibilities.

Imperfection is thus necessary, if through our power of perfectibility we are to achieve any feat of will. What the man who holds to Revelation regards as a defect is no less than the Fountain of Youth from which through every trial flows the flood of man's activities. Poor God who, incapable of development, cannot grow!

Scientific thinkers have never denied the always provisional limits of an organically circumscribed knowledge — since the task of science is constantly to seek to progress from one observed fact to another. Men of the imaginative type pride themselves on attaining limits beyond our relativity. In effect they reconstruct man according to the specifications of their dreams and only await the unverifiable illumination of death to give life to their automaton. They animate their airy marionette by the miracle of innate ideas or of intuition. Their hypothesis is based on innate ideas, which correspond to no phenomenon of which we have experience, and on intuition, which assumes that the subject can clear up the obscurity of things with its own fogs. On the strength of the products of a verbal sublimation these theorizers claim that they can regulate the activities of our organism, so as to subject our relativities to the domination of the incomprehensible absolute, and thereby assert that something which cannot be proved triumphs over our human proofs.

It cannot be otherwise the moment you depart from the theory that we must first know man and from him deduce

the laws of the universe, whereas the most elementary science plainly tells us that we must proceed from the formulæ of the universe to those of man, since man is the product of that universe. Again it is a case of substituting the effect for the cause. We must make up our minds that we shall always commit that error whenever we reach a conclusion before we begin to observe. As a matter of fact, the coördinate relation between the world-order, a link of which we are, and our mental evolution, which is brought about by sensation or by verified imagination, leaves no crevice into which to insert the great miracle of the deified Ego. Spirit, soul, divine flame, and breath of eternity are but hypotheses of hypotheses that direct life into ways outside the realms of reality. However, the organic phenomenon of knowledge, when put into its proper place in the universal chain, reveals its natural proportions and develops according to the laws of a predetermined organism.

Where do the established truths of knowledge lead us? They lead us to understand ourselves, and so to grasp ourselves amid our evolving relationships that we may better use our vital powers, enhanced according to the components of our directed energies. The direction of man's activities, permanently established within the limits imposed on them by man's origin and development, forces him toward a future, the possibilities of which depend on the organic composition of his understanding.

Our animal ancestor endured his destiny with the help of the fumbling empiricism of primitive knowledge. The moment man made his first attempt to know, he laid a hasty hand upon the tiller and set forth on bold voyages among the eddies of as yet uncharted reefs. He may escape the rocks. To offset imagination, which drives him to the open sea, he can observe the stars, and so sail back to shore. Knowledge of the stars, enabling him to cast the revealing lead through celestial space, will rectify the guesses by which he will try to round the headland. To round the headland! Therein lies reason for existence and the purpose of seeking knowledge. To perform that 'miracle' man needs only the compass and the sun.

Will the growth of mental power concurrently produce a concurrent evolution of the type of will that determines character? I should hesitate to say so. Knowledge is necessary for power, but knowledge alone is not enough. The tool is not enough to make the workman; to make a workman there must be a continuous effort of will power. However, if we consider varying man under the different aspects of his progress toward knowledge, we shall recognize that effort at least tempers character, and that sentiment becomes lofty in proportion as man grows great through effort.

Some persons, no doubt, who are purely receptive will be not much better than parrots. But in general, men bent on knowledge will stand forth from the crowd to stir and guide it. And if their orders do not always harmonize — for doctrines are only passing developments — each man will, nevertheless, in his effort to find his way, get from knowledge a general orientation that will permit him to glimpse, if not to attain, the summits. He who, with no other compensation than his hope, stiffens his determination to understand will know the higher joys of life.

II

IN THE DEFILES OF KNOWLEDGE

THE START

To step from sensation to knowledge! I have tried to explain how the phenomenon occurred. What were the results?

We have within us all sorts of reactions of 'sensibility,' either conscious or unconscious. If I touch a wire, it reacts electrically, and I react in sensations that become images, the association and dissociation of which create an organic state called knowledge through a harmony that is set up between a moment of human evolution and a transient phase of universal evolution.

Thus *to know* is to penetrate by means of sensation into the relations of things at moments when we are in harmony

with them; that is, into a chain of phenomena moving according to the synchronous correspondence of the Cosmos with the reactions of our sensibility. In varying degrees that correspondence occurs throughout the animal series, and finally reaches the synthesis of human knowledge and emotion, the evolution of which pursues its course toward the conquest of the unknown. Emotion, which is the aspiration of the whole being toward something beyond the bounds of sensible reality, will outstrip careful observation and may even mislead it, not, however, without having carried man to regions so lofty that he will never be willing to forego it. If in the race toward the ideal we often see the finest possible start, the finish is not always very spectacular. Ours, nevertheless, the moral beauty of having willed and of having tried.

Such questions could not even occur to primitive men. They 'saw.' Was there anything beyond looking, hearing, and touching? To them to feel was to know. Time beyond measure was to elapse before so much as the idea of a rudimentary distinction between the two appeared.

There were as many problems as there were phenomena. Some of the more conspicuous phenomena lent themselves to loose attempts at classification. To group parts, before attaining any notion of a whole, in a vague hierarchy of sometimes dominant, sometimes dominated powers, was a new form of effort and was followed by an irresistible inclination on the part of misconceiving man to personify every manifestation of energy.

Many were the perplexities of the youthful intellect before it discovered that every one of our sensations needed to be checked and tested if any experiment was to be exact. And what efforts were required before it could grasp the fact that every conquest of knowledge can but incite our sensibilities to new activity! To men seeking the absolute it seemed an insignificant trifle. Theirs was the foolish complaint that we are men rather than gods. Apart from the phantasmagoria of dreams, we have ample reason for willing and acting. Far from being the measure of the

universe, our intelligence obviously can grasp only some parts of it. As to human intelligence, I conceive it in the light of proved facts as a gauge capable of measuring parts of the world, but quite incapable of measuring the whole infinite field of objective fact.

As we evolved from one mental stage to another, an increased power of comprehension was disclosed that long left to the more or less ordered dreams of theology or of metaphysics a domain which, even allowing for the achievements of Sankara and Kapila, no one has much enlarged since the day of the Vedas. Exactly the reverse is true of the history of scientific knowledge, which is constantly developing.

Since human intelligence is to judge the world, the verdict will be that of human intelligence, no more and no less. To provide man with a little bit of comparative psychology is merely to put him into his place in the system of things, by way of suggesting that he try to be modest.

There is no necessity of proscribing increased flexibility of thought, as did Auguste Comte, merely because tradition has set rigid limits to the activities of the understanding. Who would dare to maintain that no flaws can be detected in our modern truths? Even a metaphysician — and there are eminent men among metaphysicians — might throw light on aspects of relative truth, were it only inadvertently. Wherever and however there is enthusiasm for knowledge, every attempt to think must be given a fair chance.

Our humble but vainglorious ancestors had neither time nor ability to consider any general aspects except those of the imagination. For the needs of their daily life they required above all else some sort of explanation of what they could perceive of the world through the contact with it of their hereditary inadequacies. We should not despise them, for from that first mental operation sprang the noblest manifestation of the planet — thinking man of to-day.

In what light could the clouded minds of those ages have regarded the universe? The distance between the thinking human being and the universe that he beheld seemed

singularly greater in those days than it does now. No objective system of 'the nature of things' could have occurred to minds stubbornly intent on bending the universe to their individual needs.

Alas! Those far-away ancestors, whose intellectual atavism could be no more than animal, have necessarily transmitted to us a handicap of dead weight, by which mental evolution, concerned for objective truth, is burdened and has been permanently retarded. Do not present generations, under the rigid constraint of impulses derived from ancestors of no intellectual acuteness, continue to live lives regulated by faulty explanations?

Doubtless, the conceptions of the ancient days have had to enlarge to accord with the developments of progressive knowledge. 'Civilized' societies cannot be expected to conform to the cerebration of savages. People are content to try to confine themselves within the bounds of those primitive conceptions which have been set up as articles of faith — in spite of the fact that those conceptions are daily contradicted by scientifically proved facts.

Could there be greater folly than to go out of our way to look for a universe subject to the jurisdiction of human reason, when human reason cannot be the cause of the universe, since it is its result? It is putting the cart before the horse. Instead of putting the phenomenon of mind into its proper place in the world-system, where it makes a handsome enough showing as a transient harmony with the Cosmos, people exalt it to the high station of a cause — only to subject it to the supremacy of an arbitrary universe of which it is a part.

Meanwhile a voice is heard crying: 'If the world were not as I say it is, it would be destitute of consolation.'

Who has not heard that cry of distress, excusable only in a child? It is asking that the limitless world be obliged to arrange itself conformably to the prayers of weak human beings, 'inconsolable' because they cannot decree a world-order made to the measure of their own defects. We are asked, in the name of the too explicable incompetence of

the past, to substitute a subjective world for manifest objective phenomena.

Whether we like it or not, we, as well as all other elements of the world, must submit to the inflexible laws of cosmic relationships which condition us. The human privilege of having a consciousness capable of reflecting the universe changes nothing, unless it allows us to oppose to the unconscious forces the fleeting greatness of a personal comprehension that, eventually relayed from planet to planet, may possibly open in the infinite a cycle of biological evolutions which can never be completed.

To confine ourselves to our own planet, does it not seem that when man shall have dared to stop lying to himself, every witness to life should have the right to be heard? Who, then, will rise to deny to any one the opportunity of discovering the truth, especially when the common run of talking men are generally willing to assign the task of thinking to a selected few? Conventional misconceptions beset our days and hold us in subjection to ritual sorceries, the domination of which, sunk as we are in the comforts of the easiest way, too often causes us to misuse our destinies.

Let us respect betrayed humanity even in its pettiness. But let no one be astonished if sometimes in the crowd voices are raised to testify to a thought superior to the mnemotechnical jargon of the mob. Let us serenely note that we have reached that state of knowledge which enables us to contemplate all the blended activities of the universe and of its creatures as a whole and to regard them as fused in the common movement.

EFFORT

It must, indeed, be admitted that the majority of human lives are squandered in the easy shams of a *spoken* idealism — often far removed from the reality that is *lived.* Fine words lend an appearance of respectability. And the deficiencies of practice would stand out even more clearly, if the priesthood did not so persistently proclaim that its rites

are a panacea for all evils. Strict or lax, but generally ill prepared to accept the ideas of objective knowledge, the crowd, in the ingenuous expectation of an eternal reward for the equivocal gesture of a life that would willingly lose none of the social advantages of following the path of least resistance, pants along, traveling as best it can between a noisy virtue of speech and in a more modest practice of vice.

Weal or woe! He who shall undertake to live according to the terms of an idea not fashioned to suit the line of least resistance, but spontaneously sprung from the depths of his being, will prove most offensive to the immense majority of his contemporaries, who in general are too ready to conform to the traditional practices of a life submissive to phantoms which bewildered man himself has raised. It is easier to submit than to struggle!

However, there is also a stern joy in following amid the chaos of egotism the noble avenue of greatness in which an indomitable will to live on the heights, far from clamor, in the silent pride of an ideal aspiring to the vibrant realities of a discreetly exalted life, can give itself free course. A resolute man, worthy of the high enterprise of knowing and of embodying his knowledge in his life, will find himself refreshed, enlarged, endowed with a new serenity. He will prosper or fail in direct ratio to the dimensions of his intelligence and especially of his character. He will give the world the comfort of his example. And, moreover, if before he returns to the elements in which both the conscious and the unconscious are received in order that they may undergo eternal change, he can fully realize the gleam of comprehension that in a sea of irresponsible beings is the reward of an independent life, the lesson of his career will be the finest that can emanate from any destiny.

On what conditions?

You must see life from above, but never lose touch with its depths through those tenuous threads of sensations, the last of which awaits the shears of inexorable Atropos. You must find yourself, as it were, halfway between earth and sky,

too near the earth not to belong to it wholly and too clearly in sight of the neighboring mechanism of the resistless forces of the Cosmos not to yield yourself loyally to the supreme sway of the unconscious transitions of eternity.

Thus must you attain the disinterested serenity that ought finally to permit the self-examination requisite for a supreme renunciation of the deceptive appeals of life — something quite different from living in the eternal, anxious wonder whether when we have ceased to live, we shall live happily or unhappily.

You must put to yourself even in your heart of hearts the questions that most persons prefer to evade; and under the pressure of the moment you must be honest enough to place yourself in your own proper compartment of the world, so as to learn from the universe what you yourself may be and from yourself how you can make a better use of a predetermined organism.

You must calmly hold as assured the mean results of the principal investigations of the general knowledge of each succeeding day, and meanwhile refuse to let yourself lose your belief in the strict coördination of elemental activities. You must reject, precisely as you reject the anathemas of the oratories, the commonplaces of that inchoate cultivation which inherited forces of intellectual ankylosis put to profitable use.

Above all, you must trust to the irresistible currents of general evolution. You must have sufficient enthusiasm to accept the normal chances of error, and you must be sufficiently disinterested to understand that without some bold adventuring there can be no action even of a moderate kind.

And when you see the welcome headlands of your home port — around which you have so long tried to beat — piercing the fog as a sword leaps from its sheath at the approach of battle, you must bravely follow the flashing steel, feeling that the humblest penknife may possess the virtues of Joyeuse and of Durandal.[1] Come what may, that is the hour of hours!

[1] Joyeuse and Durandal were the swords respectively of Charlemagne and of Orlando.

SCIENCE AND HYPOTHESIS

In a searching study of the value to each other of science and hypothesis, Henri Poincaré has made an ingenious effort to reduce our relative knowledge to the rank of a function of probability. Without embarking with him upon the subtle considerations in the course of which the play of mathematics is eventually allowed to unite with the coördinations of the sensible world, I allow myself to think that, as in the case of non-Euclidian mathematics, we may concede to any one every right boldly to throw into the line the battalions of non-objective argument. After all, do you want 'science' to be nothing but a sequence of more or less strictly coördinated observations, and, consequently, of more or less coherent hypotheses? When our ingenuity is ceaselessly trying to build up verbal structures in regions beyond our knowledge, denial is as easy as affirmation.

Theoretical systems of the type of Einstein's relativity oblige us to take refuge in the rights reserved to the imagination. We are a mere moment of the world amid meeting-points among which we try to keep our heads, while we stake out the unknown paths by which to penetrate it. The undertaking is of sufficient merit so that we should not affect contempt for it. That, however, is no reason why we should assume an easy familiarity with the absolute. Less noisy and less charming, our presumptuous chatter resembles the crash of thunder or the murmur of a brook. At least the brook shows no signs of aspiring to the roar of Niagara. Let us be what we are; we may find that we do well enough.

We must unquestionably admit that the terms 'truth' and 'error' can represent only human approximations to the facts of this universe — approximations reached through our first impulsive bound toward the horizons of the 'absolute.' Since we are nothing but relativities, namely, relations contingent on our organic phenomena and on the phenomena of a Cosmos of interminable relationships, how can the absolute of our knowledge be anything except a distortion, a wrenching of our relativities? Are we not simply confronting one of those pseudo-problems over which for so

many centuries the finest human geniuses have utterly exhausted themselves?

If you positively must have nothing less than the eternal absolute, I entrust it to your pious care; and you have my indulgent sympathy for that day on which you discover that, as the poet says, the Apples of the Hesperides are really no more than harmless but misnamed vegetables. If, by experience, we find nothing in the world except opposing forces that clash and come to terms, of what value in infinite space and time can be the fact that the verbal absolute of contemporary man struggles with varying success in whirlpools of words that do not imply even a schematic time of evolved relations?

The plough, the spade, and the pickaxe — tools relatively adapted to the requirements of their makers — have changed and will continue to change. Far from discarding them because they do not perfectly and permanently suit our changing capacities, we make the best of them from day to day, while seeking to adapt them better to our purposes. Is it not approximately the same with the implements of our knowledge? How shall we reconcile our verbal absolute with its denial by a disputant who is himself part of the universe on the same terms and under the same law as every other element in the everywhere and always coherent world?

Is it not the part of wisdom to accept our condition just as an incoercible fate imposes it on us? Our very relativity leaves the field open to every flight of the imagination. If the earth humiliates you, quit it. As for me, its solid rocks that I must climb satisfy my ambition. Christianity was founded by idealistic crowds who sought a rebirth of emotion. Scientific knowledge has called, and will continue to call, to life other and no less beautiful forms of emotion. Buddha and Christ will always remain great. The idealism of our scientific knowledge will give birth to currents of feeling fully as honorable to human nobility. And, if our children do better still, we shall die proud of having contributed to that knowledge, were it only through our own imperfect success.

I have said that the kind of 'knowledge' to which we are destined can be represented by lines of signposts. After having meditated in noble company on the value of science, such as the mathematical genius of Henri Poincaré seeks with moving ardor and sometimes even attains, I find no difficulty in maintaining my position. A long time will perhaps go by before a more aggressive guide will undertake to lead us. The imperturbable serenity of the man of science as well as that of the philosopher will be of great help to him who sees in the obstacle of doubt only a goad to further effort. The confidence of the master makes light of every obstacle. We are not bound to follow him blindly, but if, though still doubtful, we put our hand in his, we shall not regret it.

However bold it may be to argue from probabilities, it is, fundamentally, only searching for a supplementary and not negligible proof. And when people say that the 'man of science' is wrong less often than the 'prophet' when he calls heads or tails, what do they do, pray, but recognize the boldness of the man who holds a link of the cosmic chain and does not intend to let go of it? Complete modesty in complete daring — that is the state of mind that can lead us to the unspeakable joy of establishing contacts with the elements of the infinite universe. What matters the opposition of those who, unable to rise so high, suggest that we drop a sound enterprise and accept instead the illusory satisfactions of words mistaken for realities?

How can the man who tries to make the world relative to himself — that is, to take himself as the measure of the universe — grasp anything of phenomena, of their ordering, or of their significance? 'Who saved us from that chimera?' Poincaré asks himself. The answer is: Those who have shown us that the earth 'is only one of the smallest planets of the solar system, which is itself no more than an imperceptible point in the infinite spaces of the stellar universe. . . .' [1]

[1] Laplace had already astounded us by announcing that the force of gravitation is transmitted a million times more quickly than light. And that figure, if I can believe the books, is to-day recognized as even understating the fact.

Should we say that the ordinary man of our day is in a position to appreciate the simple idea that the sun is one hundred and fifty million kilometers from the earth, and that the distance of some of the nearest stars is hundreds of thousands of times greater? No. But if it is necessary to feel before we can know, increased knowledge will later bring us to an exaltation of deep sensibility that will make us live the phenomenon through emotions which accord with it.

It is not, then, the same thing impassively to state a law — namely, a constancy of relations and of relations of relations — and to join to it synchronous emotions. At the bottom of his heart man finds it easier to break with the divine hypothesis than to renounce the atavistic rites of outworn emotions.[1] Likewise, after knowledge had become traditionally established on the basis of a certain number of primordial laws — such as the indestructibility of matter — that is, the conservation of the mass; the conservation of energy; the law of least action — what a flutter there was among the 'stable truths' of our intelligence when the principle of Carnot seemed to lead to the dissipation of matter; that is, when hypothetical entropy seemed to announce 'thermic death,' or the extinction of energy. The phenomenon of irreversibility everywhere bristled with questions. Maxwell, with his electro-magnetic theory of light, may be said to have overruled Newton, whom Lorentz undermined when he invalidated the principle of the equality of action and reaction. Lavoisier himself and his principle of the conservation of mass had to go into the discard when Poincaré wrote: 'There is no other mass than electro-dynamic inertia, but in that case mass can no longer be constant. It increases with velocity, and it is even dependent on direction. . . . If there is no longer any constant mass, there is no longer any center of gravity; no one even knows any longer what it is.' Briefly, Einstein's

[1] It is an everyday occurrence. Man necessarily begins by assimilating the general beliefs that welcomed him at birth, before beginning to live by the light of his own intelligence.

relativity overthrows a great many values that were formerly accepted as approximately accurate.

Do not be astonished at this condition of affairs, which, far from suggesting the 'failure of science,' simply shows science at work. Such has been the constant aspect of the workshop of human knowledge ever since it started, and that aspect will never change. We know something, we know little, or we do not know at all, and we know inadequately what we know best. Above all, except through the experience that comes with time, we cannot distinguish among those various categories. 'Beliefs,' which are nothing except suppositions predicated on the interdiction of debate, do not liberate us from the cosmic conditions by which we are determined. Because we are relative, the structure of knowledge has constantly to be rebuilt — of mingled confirmations and doubts. As the victories of knowledge over hypothesis and of hypothesis over the unknown proceed without a pause, we bequeath to those who follow us a sum of experience always shifting, always rectifiable, always increased.

What does it matter if our laws of the world are never more than approximations? If one cannot find God experimentally in nature, it is not the 'soul' of the metaphysicians that can make him objective. When we ask what is the objective value of science, it does not mean: 'does science make us know the veritable "nature of things"? It means that science makes us know the true relations of things. . . . Not only is science incapable of making us know the "nature of things," but there is nothing capable of making us know it; and if some god did know it, he could not express it in words.' So Poincaré placidly declares. This scientist even adds that, if an explanation were given us, 'we could not understand it,' and he even wonders whether 'we really understand the question.' To put it otherwise, we can set down the words 'God' or 'the nature of things,' just as we can set down all other names of vague subjective notions, but we do not know how to express what those collections of sounds mean. They are the meta-

physics of the thing in itself. They create light by means of smoke. The defining of relations, the classification of which constitutes our knowledge, is far more suggestive. The great value of facts is that, sooner or later, they raise our emotions to their level.

THE MARVELOUS LAMP

However deaf, however dumb the world seems, it has begun to let its mysteries be pierced. Man and the co-ordinated energies under the authority of which his destinies unfold are opening an account which will never be closed.

To know! Then you hold the thread of the labyrinth! Then you feel that you are in full communion with the movements of things! Then you thrill, at every stage of knowledge, with imperfect understanding, confident that error itself is but a longer or a shorter détour on the road of truth! Then, through coördinate moments of that knowledge, you grasp the slow evolution of man toward a superior consciousness, the orientation of which as regards modern man would seem superhuman! What more could one ask?

We have taken possession of the marvelous lamp that throws light into the dark corners of things, and little by little the last traces of original obscurity disappear. Once the orbits of the stars are known, it is mere play to weigh them, to understand them, to demand of them an account of their phenomena, to infer from those phenomena a general conception of the universe, and by the same token to establish ourselves as citizens of the infinite.

In truth we have put our hand on the levers that define the energies of the world and assign to them their tasks. We travel in the air or under the sea; we talk from one continent to another, and we discover in the sun and in the stars elements not as yet found on the earth, without ever getting our fill of 'miracles' that in these cases are the products of daily verified science.

And we, who receive from inanimate things such unmerited and superior good fortune, we, in whom assiduous sensation condenses in the synergies of a personality

capable of feeling, of knowing, of willing, and of acting, we seriously ask whether such a gift is not purchased at the cost of excessive drawbacks when the very transitoriness that awakens our fears is the surest compensation for all the evils of life. Shall the marvelous privilege of mingled knowing and dreaming be the burden of our complaints? Let us not present the comedy before the dead gods, who would be only too happy at such a revenge upon our human kind.

Doubtless, in the other pan of the scales there are counterbalancing ills which a learned theodicy employs all its sophistries to reconcile with the 'eternal goodness.' It would be useless to try to measure them accurately, as much because of their number as because of the differences in their quality, which varies as the reactions of our individual sensibility vary. Whatever they are, the essential is to know whether we can establish a balance among them. If we can, we should congratulate ourselves on the great work in which the goading of the Cosmos has so actively engaged us.

The celestial mechanism is not without unknown elements and consequently can surprise us. That our earth began, implies that it will end. The sun will be extinguished. Other suns will be kindled. . . . Sometimes the sea exchanges the serenity of the stars for the terrors of the tempest. Volcanoes delight in overwhelming cities. Turn by turn, the powers of nature serve the purposes of man and then rebel against him. Without waiting until the furies of the planet are appeased, man, implacable, rises against his brother man in strife — strife of ambition, of passion, of selfish interest — excited by a natural disposition of which the best we can say is that it shows itself to be imperfect.

Weigh all things well and see whether you can conceive of a more beautiful outcome of the raging torrent of emotion than the perfect peace of a night of sleep that knows no dreams and no awakening. What madness it is to expect the joys of a passive eternity without labor and without fret; as if we could be anything but the pains and pleasures that the changing fortunes of effort balance and offset.

Death, a simple transposition of the powers of life, brings us back to the shifting equilibrium of impassive elements suffering successive shocks of sensibility, which as a result of alternating pleasures and pains force us to an eventual repose. Peace-giving death, which seems dreadful only because of our childish fear that it means increase in misery, so perturbed the stern genius of Pascal that it caused him quite logically to suggest that we live for death, when the natural problem that haunts us, and that we even find a hard enough task, is to live for life.

THE ACHIEVEMENTS OF HUMAN LIFE

It is always the same question: Shall we live life as we have received it, or shall we waste it in a chaos of imaginary activities? We must choose. We must live either as knowledge indicates — that is, in trying to realize our possibilities within the laws by which the world is governed — or in a dream deep sunk in the extravagant hallucinations of ignorance. For any one who has the courage to look at the matter closely, the egotism of a life consecrated to religious practices which while preaching neighborly love, base their doctrines primarily on the promise of satisfying a desperate selfishness is a despicable affair. It fundamentally perverts a sentiment which, so treated, shows only the value of pretense behind the transparent mask of an all-embracing charity.

Far from the crowd — the rear-guard of that expedition toward the stars which turns aside at every will-o'-the-wisp — the noblest minds, regardless of appearance, will try to compose an idealistic poem for their inmost selves to live. The higher the intelligence, the nobler, the more productive of the intimate beauty of that life, will be the poetry of men contending with their gods, as did the Titans. Doubtless there is a poetry of the gods, and even of that solitary God, without form and without color, who has temporarily survived them. But how much finer is the poem of the nobility of thinking man, struggling hand-to-hand with the world, while the litanies of passive submission are

moaning before the capricious omnipotence of a divine love, clothed in the eternal evil for which it is responsible?

Let him stand forth — the man who would purchase happiness at the price of an atrophied intelligence rather than pay his tribute of pain to the superb impulses of that noble exaltation which comes from a clearer comprehension of his place in the infinite universe! I will go even farther. If there were not a constant quality of illusion in human enterprises, many persons would be less warmly attached to them. If for man about to disappear life is but a leap from infinity to infinity, ought he to resign himself to being an imperceptible cosmic accident; or may he have a share in flights of idealism so as to live, if possible, a life of integrated experience?

Religion, I know, promises more. That promise costs only words spoken down the wind. What is the guaranty worth? Instead of lingering by the pulpits that prophesy instead of observing, let us seek. 'I marvel,' said Kant, 'at my consciousness and at the starry sky.' The marvel of them is in fact so great that weak humanity could not at the start do better than talk nonsense about them. Man's actual sensorial mechanism has been finally revealed in the full light of day, and we are on the point of recognizing the emotional value of observation. The task is to pass from uncontrolled dreaming to the enterprise of understanding, thinking, willing, and acting, and, at the same time, of preserving the marvelous resources of imagination's prolific beauty.

Such was the original activity of ignorant minds under the imperious spur of the need to know; a need which modern man, dazzled by the blinding light of later knowledge, cannot make up his mind to deny. The timidities of knowledge and the bold ebullitions of uncontrolled emotion let loose the war of intelligences. All the barricades of theology have been successively carried. There remains a central keep that will not fall without a supreme resistance.

The most arduous task is to reconcile man in his chaotic imaginings to the actual condition to which the laws

of the universe have assigned him. Mortal, he freed himself from death by decreeing his own immortality. He even wished that his god should die for him — his god, who, by definition, cannot die. Man, proclaiming himself the prime cause of the universe, childishly placed amid the infinite worlds himself and a god whose only function was to answer human prayers.

Abolishing that vision upsets all that he has felt, and thought and lived. When the feeble, who are numberless, cannot shut their eyes and sneak into the train of grandiloquent ignorance, they find the effort of living by their own strength too painful to endure. This is, indeed, a bankruptcy of intelligence struggling with an intellectual problem. Character collapses in terror before an unknown Power that holds over man's head the threat of eternal punishment.

When we renounce phantom fears and hopes — the obsession of all weak men — do we not destroy what tradition has told us is the only sure foundation of life? What a question! But, before the time of generalizing came, what had incipient observation to offer in exchange? It could offer nothing except to substitute for eternal life in the bosom of the Almighty a self-forgetfulness wholly dissimilar to the satisfaction of earthly interests which our ancestors, no more than ourselves, would run the risk of neglecting.

To require anything of the sort from the weak, when as yet the strong could point out no path except through a bitter conflict less of ideas than of the attendant emotions was demanding that they completely remake themselves. After intelligence has done its work, remains the task of developing will and character in order that we may overcome habit. How simple everything would be, how easy life would be to guide, if instead of yielding to the wasteful temptation to follow the easiest way, each one of us should simply let himself be supported by the ever-ready help of evolutionary knowledge!

Far from anything of the sort happening, primitive beliefs, thanks to words, remained fast anchored in purely receptive intelligences, which regarded the mere suggestion

of independent thought as the supreme insult. Thus on the ground that independent thinking was an 'affectation of superiority,' every hour became an ambush and even an open aggression against whoever let himself think not as others thought. Next came social punishments, of which the most cruel were not the most talked about. In contrast to that intolerance, I dare invoke the highest realization of man, which consists in believing in himself, in having faith in the virtue of his own thought, in contributing with all his energy to the lavish spending of himself amid the indifferent universe. He should speak, do, persevere, and above all, not calculate too closely the chances of success before making his attempt.

What can the agglomerate crowd of intelligences, drifting like cakes of ice in a stream, understand of a man, 'worthy of solitude,' [1] who dares to break with the delightful magic of the past, in order, unbiased by any foregone conclusions, to analyze and to synthetize every part of the universe revealed to him by calm observation? That sort of mind tried with fire and sword to prevent the investigations of disinterested knowledge. The great martyrs bear constant testimony to the fact. For centuries the Church and the societies of which it assumed the guidance occupied themselves with the art of torture and of massacre. In vain. Life, long deceived, has taken the most signal revenge. Has not the bankruptcy of the Church been definitely confirmed at the very height of the hue and cry against science?

Not that theological dogmatism seems threatened with an immediate end. It has already withstood terrible assaults. Time has done away with its most notorious abuses,[2] but without, as yet, dislodging it from the dark corners of primitive sensibilities, where it is maintained less by weakness of intelligence than by a lack of courage and a deterioration of will power. Ignorance can be enlightened. But what effort has been wasted on the blind stupor of minds that prefer darkness!

In spite of all, it is true that an impetuous desire to know

[1] Mallarmé. [2] The forms, especially, have changed.

and constantly to advance our knowledge is the trait that puts the human mind, when in full possession of itself, so far above the stolid inertia of animal nature. We are possessed with an irresistible desire to investigate that never ceases to vex the unknown with its *how* and its *why*. Whatever answers we may receive, to err is not to fail, if the error, once recognized, leads us to formulæ approximately more correct. The animal has not even 'false gods' in whose company he can wander from the path.

Unfortunately, our effort to attain elusive knowledge leads us too quickly to adopt the simple solutions of an impulsive imagination. That is the origin of the culturally derived practice which, by repeating the catechism without contradiction or questioning, allows the most ignorant, so far as words are concerned, to consider themselves suddenly superior to the laborious investigations in which the scholar exhausts himself. Such is the *science of the easiest way*, the irreparable weakness of which lies in its eliminating a control which the complicity of the crowd makes easy of evasion. Let us remember that doubt was the fruit of incipient evolution, and that in the primitive days of misconception even the word had no definite meaning. When it proclaimed itself, it became 'sacrilege' and was dealt with by the headsman. To-day, doubt merely excites the reprobation of churches that without the help of Satan would be much embarrassed.

For how many more centuries will humanity in a thousand successive forms remain a willing victim of 'orthodoxies' which began by knowing everything before they had observed anything? Science has made doubt reputable — to the scandal of those who will never know doubt. Prophets, heresies, sorceries, demonologies, magic, sibyls, pythonesses, oracles, augurs, fairies, elves, goblins, gnomes, genii, ghouls, vampires, phantoms, kobolds, cabala, gnosticism, miracles — all have had their day, and still have it. They are survivals of the atavistic mind, which lacks the ability to find out how to state a problem before attacking it. In any event, we have yet to be told why God created

the world. If any one should try to tell us, the failure of the providential design would become obvious to every one, for even that accomplished nothing except a serious increase of evils without compensating utility.

Even if it were universally admitted that the world was the caprice of an omnipotent intelligence, the postulate would still have to submit its proofs to the tribunal of scientific knowledge. The attempt has been made, but with what success did it meet? You will hear that 'proofs' abound. A single one would be enough, if it were universally decisive.[1] Now, such a proof is precisely what the Church has never been able to furnish. It would have made the martyr's stake unnecessary. To burn men, or even simply to curse them, is not to answer them. The Church is making that discovery to-day. We need only analyze any 'miracle' to make its inanity stand out. The 'miracles' of 'false gods,' which are as authentic as the others, had, and in divers countries still have, just as many believers as our Judeo-Christian 'miracles' of to-day.

We have finally come to recognize that the dispute lies between dreams unchecked by observation and experimental knowledge perfected through the imagination. Shall we seek objectively to know, or shall we choose rather to guess, to stand gaping at the clouds of befogged and delirious fancy? That is the question of yesterday, of to-morrow, of all time. Man's wanderings hither and yon in the formidable field of the explanation of things have caused the most atrocious tragedies, but have never checked his eagerness to know. Both dreamers and scientists have contributed what they could. The struggle is as fierce as ever. Meanwhile, compare the conquests of relative knowledge to-day with the regressions of the absolute.

Indeed, we wish for knowledge, and we passionately consecrate our noblest energies to the task of gaining it. Although we pursue truth, it is the fame, the prestige of the

[1] What would have been simpler for the Divinity than to show himself, if only to save so many innocent blasphemers from the eternal torments that he had no need to create?

word, rather than the acquisitions that knowledge makes through the progress of positive science, which attract and hold the majority. The sheep-like mob is not interested in a scientist in his study, who cannot always earn the means there to spend an obscure life. But if celebrations are in order at which to discuss him after his death, banquets at which the guests will heap new honors upon his name will not be grudged his memory. As to the truths resulting from his labors — truths always open to dispute and to eventual revision — what do we ask of them except that they trouble as little as may be the course of our complaining inertia, the errors of which have retarded the progress of former generations?

Thus, whenever anything appears to threaten the familiar formulæ, some one always reminds us that our knowledge is expressed only in provisional terms, and that the most advanced science is unable to 'settle' anything. We know it. We also know that the same is true of the 'eternal verities' of theology, which differ in different ages and in different countries. The earth is littered with fallen verities. The system of Ptolemy was 'true' until Copernicus came along. What is going to be the fate of the Copernican theory? Was there not talk the other day of dethroning Newton? Even if we were to pull him to pieces, a greater glory for human knowledge on its irresistible march toward ever closer approximations to the truth that is our ideal would result from the incident.

In the case of definite misconceptions, this instability of knowledge affords an excellent text for digressions. Well, yes, human truth is progressive; that is, it is riddled with deficiencies continually filled by the achievements of verified experiment. Its value lies precisely in its continuous and increasingly effective effort. That is its outstanding merit, not its weakness. Its superiority to the *unprovable* consists in its always remaining open to new proof, which may appear at any moment. Its success lies in the new approach to an ever more complete comprehension.

Here again words tend to deceive us. Provided 'error'

keeps contact with the thread that leads along the path of future investigation, it is an incomplete 'truth.' And truth itself, since for us it can be only relative, is inevitably honeycombed with elements of error.

We are not gods. Gods were supposed to have complete knowledge. What have they done with it? Why did they communicate to us such parts of truth as they judged us worthy of in a form which, to protect them from scrutiny, nothing more effective than the stake could be found? The fagots are extinguished. It would be hard to rekindle them. There are plenty of other ways in which to oppose the need of knowledge, universally sought and universally and persistently fought. Far from dreading contradiction, science seeks it.

The pompous name of intangible 'dogma' [1] merely emphasizes the radical opposition between what has been promised to us and what we have received. Open the holy books of all the peoples of the earth and you will find a paucity of 'knowledge' in keeping with the archaic ages in which the enterprise of knowing could not be completed by verification. That surely explains why the 'eternal verities' pass current like the others. In Christianity alone what contradictory dogmas, and how many ensuing schisms there are! Imagine the result if all cults were to put on exhibition their dissident 'infallibilities' that have proved fallible!

We know the history of 'dogmas.' They are still being born every day — to wit: the Sacré-Cœur, papal infallibility, the Immaculate Conception. What, and of what quality, is an absolute truth that instead of simply disclosing itself in the full plenitude of its majesty, doles itself out bit by bit in the course of ages? [2]

[1] It is very significant that originally the word 'dogma' merely meant 'opinion.' The merciless logic needed to uphold 'Revelation' was required to make it express that particular kind of opinion which cannot *humble itself* to undergo proof. It is a confession.

[2] Hence, the believer, lost in the polytheistic apparatus of a verbal monotheism, has created for his own personal use a cult suited to his capacity under the ægis of one of those demi-divinities into which the invisible Father of the unfortunate Galilean has been resolved.

There are not two brands of truth at the service of our knowledge. Whoever, without regard to controlled observation, proposes (being unable to impose) any form of intangible truth is out of date.

Indeed, terrestrial truth, modest but powerful and ever increasing, is disparaged by those very persons who, though profiting from its conquests, dare to repudiate its finest efforts. *Odiosa veritas!* How can the same mind contain both the irresistible desire to know and the fear of finding what it seeks? The reason is that we are afraid to subject our ignorant atavistic reflexes to the test of scientific observation; we are afraid to give up the puerile stupor of ancestral intelligence in order to replace pretended certainties based on appearances with prosaic approximations of reality.

Hence, every honor is paid to whatever disguises weakness, and every contempt is cast on the thankless labor that little by little brings us decisive conquests of knowledge, and that, at the same time, requires a virility of character demanding time and courage to assert itself. How painful it is, therefore, to see the crowd, struggling for enfranchisement, forget in the presence of temptation its respect for its own cause — to the despair of those who pay the penalty of having the noble trait of superior unselfishness! That a Condorcet should drink poison in his little hut at Sceaux matters little; but what of his detestable denial of his best friends in his mad cowardice? How shall we judge the pitiable ignominy of those members of the Convention who, bathed in blood, prostrated themselves in the antechambers of Napoleon! The victim of Golgotha presiding at the stake! That is the basic fact of human history. We must calmly face every outrage to the dreamed-of ideal, and we must meet the apparent contradictions of the hour with unmoved heart and without even that flinching implied in the famous cry, 'Father, why hast thou forsaken me!'

All the efforts of man in their rhythmic alternations between strength and weakness are living contradictions, but in his successive fits of boldness and moderation he tests his

powers and is thus permitted slowly to attain stage after stage of knowledge and to adapt himself to each. Even so, there are perhaps hours of general surrender more painful than sanguinary conflicts. Demosthenes, who in word and deed was one of the greatest men of history, could do no more than shed the light of his aureole upon the great repudiation of Greece, which, after opening the path to all the splendors of the ideal, was to deliver the world over to every excess of force. What a fall from the finest flight of idealism to the verbose degeneracy in which the fate of humanity is at stake! Rather should man unflinchingly and proudly accept the worst that life can do to him.

'If I had my hand full of truths, I should open it,' says one. 'I should carefully keep it shut,' replies the other. It is idle to choose between attempts to know, always subject to verification, and the secret fallacies of the deceptive word. Evolution has decided between them.

III

THE UNKNOWN

The words 'known' and 'unknown' express states of the human mind corresponding to states of objective fact. Should man disappear, 'known' and 'unknown' would no longer have any significance.

Our need of knowledge delights in categories, but for the purpose of knowing classification is not enough. Classification must agree with objective coördinations. Since the universe is exclusively composed of relations that can never be broken, it has not, and cannot have either a beginning or an end at any point whatever. Therefore, our knowledge of relationships is limited to points of juncture between what merely seem to be completed episodes in the infinite movement of things. If we could fathom all the relations of phenomena, we should find no more phenomena to define.

The distinction between our known and our unknown is intended only to express infinite action in a way that suits our relativity. By what means and by what authority can

we conceive and define in infinity a definite mass of things *unknowable*, which shall represent the extreme limit of our relativity? Where can we grasp the relation between the boundless objective universe and the shifting outlines of our subjective selves, the characteristic of which is that they are undergoing an evolution that cannot be predicted? The known and the unknown intermingle in our minds at every hour, according both to the evolution of the world and to the evolution of our relativity. Moreover, it often happens that we increase the divergence between them, and too often even deform them with fragmentary or generalized misconceptions. Added to the confusion caused by such accidents are the emotional disturbances suitable to excite and to strengthen every aberration of the understanding. And, as we grasp only successive images linked together by the processes of coördination, it is easy to appreciate that in all human knowledge a very large element of ignorance must be discounted.

This summary sketch helps us to comprehend how words betray thought in trying to fix in verbal form changing and complex phenomena that mingle and interpenetrate with results that they too frequently succeed only in misrepresenting. The metaphysician, intoxicated with the sound of his own voice, boldly makes living — that is, unstable — entities out of words; he creates a transcendental jargon incomprehensible in its abysmal complexity and consequently loses himself in an imaginary world of his own creation.

Putting this aside, let us pass directly to the effect of knowledge, which is to record a perpetual shifting of relations. It amounts to little or to much, according to the point of view. Fundamentally the formula is the same as Descartes's — to wit, matter and motion — which approaches the general problem by the double postulate of *substratum* and of energy, conceptions which we are obliged to fuse as soon as we have verbally separated them, but without which all our efforts to understand would be futile. See what happens to us when the atom is defined as a hole in the ether. Apparently the electronic hole consists of an

absence of ether,[1] which permits motion, when all we can say of ether itself is that we have created the word, as we created the word 'atom,' in the expectation of finding with the aid of a name a corresponding objective reality,[2] without which, so far as our limited intelligence is concerned, the mechanism of the world will not work.

Mingled ignorance, knowledge, and misconception are the constituent elements of the status of our intelligence. To be conscious of the fact is, perhaps, the finest feat of our intellect. However, the perpetual need to know does not permit us to stop there. Photography testifies to a universal succession of instantaneous impressions during the incessant storm of cosmic activities, amid which we find our nervous membrane unrolling like a sensitive film. Imperfectly sensitive as we may be, the *film* of the Cosmos and the *film* of the individual never cease to turn face to face so as to exchange the radiations that determine those points of contact which we term phenomena, and which at bottom express only the successive stages of our subjectivity. Thus, stages of correct or faulty knowledge follow one another, not only in passing sensations, but also in the proper interpretations thereof. It is the law of human intelligence to generalize and to systematize every momentary stage of knowledge in a provisional synthesis of the 'known,' a synthesis which determines the more or less ordered judgments of sentient man on the insentient universe.

Thus we find ourselves in a position to understand that all the relations of the Cosmos, including man, must be in harmony if the 'universal order' is to be realized. We can get a partial understanding of that order through the readjustments of observation; but we cannot circumscribe it within the bounds of our relativity, for it is the limitless whole of which we are only a part. But what we do know, and that of which we like to think we have a presentiment, we can imagine and clothe in verbal form if not with life;

[1] There can also be various degrees of condensation in the ether.

[2] To create a name for something unknown to objective experience, to be used in our inductions, and yet not deify it, was a great step forward.

and to live, not only by what we know, but also by supplementary aspects of a mirage-like unknown which our imagination opens to us, is a great comfort. The value of our explanation is proportionate to our faculties, and the state of our understanding will be the highest speculative interest of our lives, the employment of which is, in sum, to explain the known and the unknown (experience and imagination), in order that we may get into harmony with our environment. If we had not the unknown to decipher, how could we employ ourselves? What reason could there be for any activity on our part? We should be gods, incapable of choice or preference, and we should not even have the incident of Eden to tell us anything of opposing forces.

How can we justify that haunting fear of the unknown which has made us fall into so many follies, now that we are freed from the fogs of animal ignorance and that, following the example of our worthy ancestor of the quaternary age whose crude axe of flint founded modern mechanics, we can boldly begin the elimination of mystery, instead of confining ourselves to propitiating idols with rites? People have, indeed, taken great pains to convince us that our sensations deceive us. In fact, the original liability to such deception is common. But can we not choose between the *revealed* fictions that wish to escape all critical control, and the errors of observation that we can rectify? Experience can supply its own tests. To this day, even Divinity has been unable to do so much. It claims that it has given us complete knowledge, but only with the proviso that we put it to no proof. Were not theology helped by unintelligent emotion, its shrift would have been short.

We are what we are, and that is much more than the humble obscurity of the successive phenomena from which we sprang would have permitted us to expect. Tossed from the unknown to the imaginary and from the imaginary to the known, we can cast anchor among the first rocks of scientific knowledge and there ride out our fate.

We are a gleam in the dark storm, and our value lies in an ever strengthening consciousness in which the objective universe is mirrored.

IV

DOUBT

IN THE BALANCE

'Certainty' is that mental state in which we enjoy to the full the sensation (more or less justified) of knowing in proportion to our capacity. Contrasting with certainty is 'doubt,' which after weighing all the evidence leaves us still hesitating. These definitions appear simple, but they contain serious difficulties. The reason is that the organic phenomenon of comprehension, which on the surface is so simple, is complicated in the depths of intelligence by a formidable emotional problem.

Man, indeed, can only be fully himself when he is able to estimate the intrinsic value of his knowledge so that he can rule his emotional reactions, and keep them in bounds within the terms of his personality. Man can build up for every stage of his evolution an historical synthesis of those intellectual proofs to which he is led by experiment, mother of mingled restlessness and calm,[1] and imagination, too quick to be satisfied with appearances.

If in the matter of our experiments the question were one merely of bookkeeping, all we should need would be a series of verified observations in order quite dispassionately to extract from the whole the formula of a synthetic hypothesis of the Cosmos. But, under the influence of the emotional reactions that are an essential part of our mentality, our registering apparatus finds the information that it gathers from empirical observation continually thrown into confusion. Thus, the knowledge that comes from attentive examination of the world is too often overwhelmed by a flood of concomitant emotion that overflows and submerges every result of impassive experiment — supplying us sometimes with opinions that are not well founded. On the one hand, there are the sensations of positive fact to be weighed, to be classified, and to be used in the confusion caused by

[1] The progress of knowledge implies an organic restlessness that is the mainspring of human intelligence.

our excited sensibilities that falsify the correlations of the impassive objective world, and on the other hand, there are the sensations of our subjective selves in the agony of the hour which is near its close. It is a phenomenon the more prone to trouble us, since the slight changes in meaning of the articulated word — the language of generalization, of abstraction and of metaphor — always disfigure the thought.

Of what compositions of ignorance, misconception, and emotional interpretation, then, is the thinking man of our day made, and how did he happen to be, or to become, such as he is? In these embarrassing circumstances what a help it is cordially to welcome doubt, whose balances constantly tempt us with their endless oscillations. Turbulent emotion, so quick to obey every impulse whether sincere or feigned, will decide the final action through a compound of positive knowledge and of imagination — a coin which does not always have the right weight in the money scales.

DOES DOUBT COME FROM KNOWLEDGE OR FROM EMOTION?

We must be careful to make the proper distinction when we speak of the phenomenon of doubt which, owing to the impulses of our sensibility, holds us suspended halfway between *yes* and *no*. We must decide whether it is caused by emotion or knowledge. We have raised the question whether the kind of 'certainty' which the emotional apparatus supplies is as valuable as that supplied by the organized structure of experimental knowledge inductively coördinated. It is a scholastic question which made Pascal suffer cruelly, and on which the entire Sorbonne has expatiated. The truth of the matter is that the problem presents itself mainly in the obscure corners of minds that allow themselves to be influenced more by general emotional unrest than by the scientific quality of inferred conclusions.

The two mental processes are so different that their intrinsic value must necessarily vary. The knowledge that we derive from observation is slow and laborious, and is perpetually seeking the test that will refute it. It is constantly checked in its efforts at penetration, not only by the intricacy

of cosmic action, but by the variations of our sensibility, and it is all the more worthy to inspire confidence because, after having been verified, it always leaves a door open to critical re-examination. May not the entire good faith of relative certainty and the full allowance made for the uncertainty that springs from the enigmatic unknown explain the natural ebb and flow of doubt, which stamps human knowledge with the seal of its own relativity, only to open to it the undefined domain of a potential greatness, far beyond the transient conditions of the present day?

Quite different in procedure, the emotional currents, spontaneously flowing from the sensation of things and acting under the law of least resistance, put a facile trust in imaginative explanations and take the conduct of human life, indifferent to the account they will later have to settle with science. No more delay, no more hesitation, no more doubt; none of these can exist in the triumphantly energetic affirmation in which at a stroke the sum of total available emotion awakened by the shock of cosmic action on our sensitive surfaces is spent. In such circumstances doubt would be illogical, for there would be nothing in the nature of fact to which it could cling. 'The great reason,' Père Canaye tells us, 'is that there is no reason.' For emotional thinkers, the doubt that we invoke as a basis for our investigation is merely the most insistent, and therefore the most dangerous, form of mortal heresy, and Montaigne's genius lay in his turning it against those who boasted of not knowing it. The doubt of the ancient philosophies was nothing more than opposition to the fanciful elements of the legendary myths. Before the days of science the challenge of the query, 'What do I know?' lay in its guileless interrogation of the passing, never-ending train of badly framed questions.

Whatever may have been or may be the philosophic place of emotion in the scheme of past or future knowledge, we must always recognize its incomparable merit in having aroused in us the convictions that made possible actions of complete self-abnegation that we might bear witness to

what we deemed the truth. Look at the Christians dying in the circus, and then at their later analogues, the 'heretics,' piously massacred by the lawful children of the martyrs. Then, by way of contrast, consider the fact that scientific experiment, with its legitimate explanations, more easily produces in people the tranquillity of passive assent than any act of heroism in its behalf. However, under the complementary action of the highest emotion, the very flower of the martyrs to scientific knowledge died in torture at the hands of the Church, as if to bear witness that science in its turn could inspire sacrifices of high unselfishness; and science was in this superior: it never delivered a man, or even a book, into the hands of the executioner.

The reason is that we evolve. Primitive imagination, still awaiting the corroborating testimony of experiment, gave itself free course in every field beyond the reach of our relative minds. Observation, however, did not set its first milestones without an expenditure of emotion, whether superficial or deep, that had a basis of reality. The Church rode unchallenged in the lists of the unknown. Empty verbal formulæ, lacking the solid foundation of verified experiment, passed current. As knowledge is always open to revision, it never ceases to offer us at all times the support that we need for life's finest development. If the sustaining platform of fact becomes enlarged through the progress of knowledge, the more extensive, the greater, the more fecund in happy initiative, will be our field of endeavor. Observe so that you may act. To imagine, to be emotionally exalted in order to outspeed knowledge along the path toward the ideal; to hope, to live at the highest point of your dreams — is that something to be disdained?

Man, then, urged on by motives successively broadened, can yield to the urge of his various powers to undertake a task beyond his capacity and realize it in part through the correctness of his methods. Thus, the progress of human society, in which the action of organic development and the unconscious resistance of an obstinate atavism both have a share, will derive decisive aid from idealistic emotion — so

bitterly opposed, alas, by inherited error. What will assign its proper place to each of the two contrary tendencies so as to create an average hereditary evolution leading to human growth? Temporarily, experience will decide the matter. Even so, the progressive action of our evolution teaches us each day that there is an *eventual margin of doubt*, imposed on the ingenuously absolute formulæ of the imagination by the relative nature of our scientific knowledge.

PHILOSOPHIC DOUBT

'What is truth?' When the question was deliberately put by Pilate to Jesus, who described himself as the bearer of truth, the Evangelist does not tell us that Christ attempted to reply. Never was a finer opportunity for an authoritative utterance more vexatiously lost.[1] The words 'truth' and 'error' are abstractions necessary to the generalizations of knowledge. All we need is to be able to express the conventional value that attaches to those symbols of that absolute which we cannot realize except as something built up out of relative truths. It was on account of our unlucky mistakes in that domain that, under cover of the most grandiloquent words, so much blood was shed.

Not that superior minds were unaware of the vanity of our dogmatic affirmations. But how could any one approach the problem at a time when not so much as the formula of a different explanation was available for testing by the imprecise experiments of the period? Uneasy minds naturally had recourse to a less sharply defined affirmation. As was only human, the less strongly felt certainty yielded to primitive 'absolute knowledge,' which is incompatible with our organic relativities. Next, doubt, arising either in imagination or in observation, appeared. To appreciate that we could mistake or even be ignorant was a decisive step in evolution. The suggestion still disconcerts many a person

[1] To this end was I born, and for this cause came I into the world, that I should bear witness unto the truth. Every one that is of the truth heareth my voice.

Pilate saith unto him, What is truth? And when he had said this, he went out again unto the Jews . . . (Saint John, XVIII, 37, 38, King James Version).

even to-day. That did not prevent people from going to the length of burning the doubter alive, in order thus to make an end of his detestable heresy. Alas, even that was not enough. The 'evil' lay at the very foundations of human nature. It increased beyond measure. The most beautiful hymns of the Rig Veda end in formidable questions. By an ingenuous syncretism that ultimately became a refinement of irony those hymns demanded, almost before they had finished chanting praises to God, in terms to which there was no answer, that he explain himself. Such sentiments could not have come to exist even in religious invocations, had they not resulted from long meditation.

Through the philosophic schools of antiquity Aryan doubt was scattered in many forms and finally reached the melting-pots of Hellenism; and there the lofty thoughts that still amaze us were freed of their dross. Bold and intemperate affirmation had gone so far that soon a graduated scale of belief appeared and became established. Neither Asia nor Greece, any more than ancient Rome itself, knew faith in the inexorable sense that Christianity was for a time able to impose on it. *Believe* or *die* were the two horns of the dilemma that it offered. Luckily the Church no longer controls anything except the fire pits of the other world; doubt, firmly established, has compelled it to give up flames in this world.

None the less, in terms of 'dogma,' doubt remains the heresy of heresies, since to doubt is to differ, to wish to understand rather than to accept with closed eyes formulæ that cannot be verified. Is not turning the thesis of the priesthood into dogma tantamount to suggesting its antithesis, that is, to exaggerating the chance fluctuations of knowledge to the point of making criminal assertions of an independent system of thought?

Brought face to face with science, doubt thus became the original and necessary factor in all comprehension. Indeed, doubt is that which as a matter of fact awakens in us the need of knowing — that is, of assimilating, of making our own what, within the limits of the sensorial relations of our

subjectivity, we can grasp of the objective world. Doubt is whatever keeps us constantly harassed with its shifting and uncertain explanations, which our curiosity about the universe will never end. Doubt, moreover, is that which in all the encounters between man and the world awakens in us the impulse to search out the eventual fault in every affirmation to which experiment leads, in the constant hope of reaching a more accurate definition. Again, is it not through the questioning of doubt, which represents the lure of the unknown beyond our relative knowledge, that knowledge itself gives us the sensation of uncertainty concerning coördinations that we have provisionally regarded as established? The best proof of a misconception is that some one forbids us to doubt it.

And since doubt boldly attacks those sensorial interpretations which, duly verified, represent our direct knowledge of the world and of ourselves; since it leaves us no rest in the endless labor of seeking ever-increasing and ever-renewed knowledge, how could any one conceive its failing to insist that dogma exhibit its credentials — dogma that for all proof declines to discuss the point? Thus, to proceed on a basis of doubt, which is the *modus operandi* of investigators, is canonically decried by all the dogmatists, who hold for intuition or for Revelation, and who would avoid all contact with scientifically established relations. I say nothing of the caprices of the professional skeptic who amuses himself with doubting his doubt lest he encounter a fact.

In spite of the crafty efforts of timid minds to conceal the true nature of doubt by letting it sink, after the manner of Montaigne, into a mere convenience for disguising negation, it remains the mainspring of the highest activities of the human mind. Lacking the refinement of doubt, the animal can do little except pass from one sensation to another, profiting by those it can associate, and letting those which elude the uncertain processes of its observation go to waste. Whoever has seen a dog following the scent of his game, questioning in turn leaf, wood, and stone, and picking up the lost trail by a succession of deductions, will recognize

the functioning of doubt during the transition from thought to action. Careful observation will definitely classify doubt among the elemental operations of the understanding in the course of its evolution in the thinking series. In its proper place among the activities of the intelligence, philosophic doubt is, and can be, only a super-proof of honesty. Kept to its legitimate function of a dial that indicates the oscillations of knowledge, it affords us a powerful regulator of thought. It assists whoever invokes it in making new investigations. Whoever repudiates it avows his fear of being undeceived.

At the moment, I am considering only that form of doubt which is the touchstone of knowledge; the doubt, that is, which animates the investigator and to which should be credited all critical reactions which investigation may excite; and I am not considering that form of doubt which in metaphysical doctrine stands halfway between affirmation and negation. Far from being such a proclamation of weakness, philosophic doubt seeks to rid every human problem of the traces of uncertainty, which, however, on account of our relativity can never be completely eliminated. What does it matter if, in spite of Revelation, there is neither an alpha nor an omega? It is enough that doubt intervenes in the search for approximate knowledge by determining the tangents that fix the limits of our comprehension.

THE CONFLICT

Christianity, whose original propaganda was emotional rather than dogmatic, troubled itself with theory no more than did its prophet. When the councils for formulating a doctrine came into existence, the freedom of belief that Christians claimed suddenly gave way to the decrees of infallible authority.[1] As a natural consequence, doubt was cursed, but continued its opposition to presumptuous decrees that because they lacked experimental support, could answer only by excommunication, by the dogmatic stake and flames. Since the divine creation was fated to disap-

[1] The mystery is easily solved; the minority had become a majority.

point the expectations of the infallible creator, doubt became the abettor of heresy, was proclaimed to be diabolical, and was canonically personified in the fallen archangel. The 'philosophic doubt' of Asia expired in the torture chambers of the 'Holy' Inquisition. But no decrees of the 'Fathers' could change the constitution of the human mind; doubt, fertile in mischief, took shelter in Rabelais and Montaigne in order to ward off from us the endless torments that had become the supreme law of the God of Love.

To take a position halfway between science and Revelation in order skillfully to pass from one to the other became a mental exercise, praiseworthy as evidence of a capacity for intellectual arbitration. To say 'I doubt' became a cheap and easy way of obtaining a diploma to prove that one had thought. Generally speaking, the word simultaneously expresses both the inquiry and the poverty of means, which, since our knowledge is only approximate, explains every reservation, whether of form or of substance. The chief advantage of such procedure was that when any one undertook to give equal weight to every contradiction, no one was wholly displeased, and almost every one was satisfied. The priests, who held with Revelation, saw its decisive supremacy recognized in reservations with which, though purely formal, they could be content. Success for both parties was for the moment assured, since the scientist himself as a general rule was only too ready to conform to the wishes of the dogmatic powers by means of trite formulæ of adhesion, serving as passports for every labor of observation. Even the unfortunate Lamarck made use of them, although he could never overcome his cruel fate.

At last the day has come when, for the mental liberation of man, scientists, unaided by the torturer's instruments of conviction, have won decisive victories over the absolutism of dogmatic oligarchies. The lives of suffering that so many of them lived form the most noble, the most cruel, pages of history. Many gave the best part of their lives with no other reward than the consciousness of having done well. Dreaded by the masses for their 'sorceries' and by the

masters of the world, whom they made uneasy behind their walls; cursed and delivered to torture for having sought for something superior to the rites of the priesthood, they sacrificed everything to the hope of understanding better and of doing better, even at the risk of expiating the rapture of their glorious effort in the torture chamber or on the scaffold.

Have you paused in the Louvre before the mute poem of Rembrandt's 'Philosophers'? A cavern, symbolic in its obscurity, is pierced by a sunbeam that irradiates with a golden haze the resolute, shining faces of men who in peaceful serenity are wholly absorbed in the joys of heroism. Tongues of light play about the spirals of a Jacob's Ladder that rises toward the sky, there to search for the secret of life, while under the vaulted roof, where darkness and light contend, may be seen the living embodiment of the ardent drama of thought. One man is suddenly held motionless by the difficulties of his book, another is wholly absorbed in following the flight of the idea, wrapt in the triumphant hope of imminent knowledge. Both, crowned with the aureole of a splendid ideal, indifferent to the outside world, are oblivious of the fact that holy people, kind to those who bow before their misconceptions, are yonder piously making ready the martyr's stake. The greatest moment of man at his very best is magnificently caught by the sublime audacity of genius. Let us be assured that there is something of that indescribable nobility in each one of us, and that it is for fearless men to set it free.

We are all more or less strictly dependent on the society in which we live — a society based rather on weaknesses seeking mutual support than on disinterested ability. At all times and in all places it may be dangerous to speak too clearly. Consequently, men find it more profitable to put themselves right with the world by using the compromise terms of an intellectually elegant doubt — all the more acceptable, since those whom the pretense aspires to disarm practice it on others. By chance that disguise of philosophic doubt, the primary object of which was to prolong the supremacy of dogma through the use of equivocal terms,

came, under the cover of verbal orthodoxy, not only to prepare (with Montaigne) a place for knowledge based on observation, but also decisively to substitute for the stammerings of Revelation the views of scientific synthesis, from which no one can ever again escape.

UNDER THE SPUR

Thanks to the two-edged sword of conventional doubt, the Renaissance in the name of Hellenism, transmitter of humanistic philosophy, was able to oppose a pagan tolerance of thought to the dogmas of the Church, and to bar the road to religious absolutism before modern science was established. In France the names of Rabelais, of Montaigne, of Descartes, of Pascal, and of Voltaire are conspicuous landmarks along the course of that history. They mark points in the evolution of doubt, for they illustrate variations of thought which reveal the full strength of man striving for knowledge through the utilization of every form of verified interpretation.

We think of Voltaire as an able comedian who upsets the temples of his own God merely for the fun of raising to him a temple of his own contriving. We are no more interested than he was in whether he believed or not. No cruel doubt haunts him. The two-edged reasoning of Montaigne, the shameless laugh of Rabelais, the dry tension of Descartes, the torments of Pascal are all unknown to him. He narrates. Montaigne also narrates, but less for the sake of narrating than of suggesting to others, and perhaps to himself, conclusions that secretly make him tremble more than he is willing to admit.

Montaigne is a fisher for propositions who will not guarantee his catch, and who, lacking the courage to do more, makes fun of himself and of his reader. It is obvious that it costs him nothing to pay lip-service to the Church, the dominant power of his day. But who, pray, unless he had the divine scales at his disposition, would be content with words the metal of which does not give back the clear ring which ultimately determines action? This incomparable

writer lets his thought show through, without even pretending to be concerned about it. If he has in mind anything more than what appears on the surface (which is not certain), he leaves the future care of it to any one who may be interested. What happens to it matters little to him. So treated, doubt is no teacher of moral activities. It is superlatively an ingenious art, a convenience. It is a convenience for the writer, who, thanks to the resources of the method, can say anything he will, and a convenience for his readers, who at their own pleasure can recognize it, or be fooled by it, or even pretend to be fooled by it. Therein lay the great success of the eminent Gascon, for, since the sacrosanct theological proprieties were safeguarded from the start, he compromised neither himself nor his friends.

That was the real reason why the general distribution of his work was all the more strongly assured during a long period. Men read him eagerly; they tasted with delight the divine poison which enabled them to doubt everything without compromising forms which had to be respected. How enthusiastically Pascal — who is the extreme opposite of Montaigne, and who, although he criticizes him severely, profited much from him — threw himself body and soul into the agonizing problem which amused the Gascon Jew. Thus we find the name of Montaigne in the 'Atheists' Directory,'[1] while true believers awarded him a place of honor among the apologists of their faith. Such is the value of ambiguous discourse that holds an even balance among insinuations fit for all purposes. Doubting everything and believing everything are two intellectual operations originating in the same emotional sources.

The Church was indulgent to the man who wrote: 'To roast a man alive for his convictions is placing a very high value on them.' It forgave that child of Israel for sneering at executioners, and since he declared at the outset his complete submission, even entrusted to him in a particularly difficult case the task of substituting in his own works

[1] *Dictionnaire des athées.*

the word 'Providence' for the word 'chance.' Were it not that he declared himself on every occasion an obedient child of the Church, no one perhaps would ever have doubted his orthodoxy. What did it matter? Rome could trust him. At a period of religious warfare he showed none of the qualities of a man of action. In abandoning his family name, which betrayed his Jewish origin, for the purpose of making an 'ancestor' of his grandfather, who was actually a dealer in provisions of all kinds, the Seigneur de Montaigne lets us see impulses far from philosophic. That while mayor of Bordeaux, he fled from the city when it was being ravaged by the plague remains an unpleasant biographical item of which the 'Essays' omit all mention.[1] No doubt as to what his duty required could then prevail over his timidity. Can any one claim that it is enough to lie in ambush at the crossroads of thought and to discharge steel-pointed arrows at whatever happens to go by?[2] Very differently did the combative Rabelais conceive of life.

Rabelais's work can be mentioned in any discussion of

[1] Begged by the aldermen to come to preside according to custom at the election of his successor, he declined to return to his city 'in view of the bad conditions that prevail there.' 'I will come as near to you as I can,' he replied, 'that is, to Feuillasse, IF THE DISEASE HAS NOT ARRIVED THERE.'

[2] It is never too late to mend. A friend whom I regard as one of the most intelligent men of our time says to me again that I have been unjust to Montaigne. Now at the last minute I am much afraid that I am at fault. Perhaps I have expressed too brutally the reactions of my own sensibility to the sensibility of a time with the form and character of which I am not sufficiently familiar. I could not pardon myself if I let my pen run too easily on the subject of a person of his strength and quality, for, as one of the masters of thought, he is an honor to his time and to his country. Pascal was brought up on Montaigne; nothing more need be said on that score. What shocks me in the Gascon sage is perhaps his fear of the heights; his determination never to aim too high; something in him that looks like a distrust of the far-away horizon. It is nevertheless true that Montaigne was preëminently a powerful liberator. He had no scientific vision, but with a bold hand he opened the gates to every free construction of thought. That achievement placed him beyond the reach of rivalry. That alone should be enough to put us on our guard against excessive severity.

As to Montaigne's deplorable attitude during the confusion of the plague at Bordeaux, I can see no excuse for it. But I cannot help citing a fact that was unknown to me. La Boëtie died of the plague, and until the end Montaigne never left his side for a moment. Let us avoid absolute judgments.

doubt only by way of contrast, for if ever there were pages in which the clear note of virile knowledge rang above the human tumult, those pages were certainly his. Their fundamental thought is nothing less than a complete mental revolution. What revolution? It is a total subversion of the order established under the authority of the implacable Church and the advent of a new free world. Unquestionably, it took heroic doubters to clear the way for him. Through the supreme art of conventional doubt, Montaigne shows very clearly how far his contemporaries still were from the undertakings of scientific knowledge. Rabelais, on his part, did not take time to doubt. The stake was too near at hand! He came so close to it that it required the King to save him. But the great monk doubted neither himself nor the future destiny of knowledge. He thinks, he knows, he wills, he advances, fencing with cut and thrust after the fashion of Friar John and making it clear to Montaigne himself that courage is a safer counselor than fear. When the author of the 'Essays' entered the lists, the battle-field had to a great extent already been cleared.

Incapable of pretending doubt, secure in the strength of his learning, Alcofribas merely took the precaution of having recourse to allegory. But he made the allegory so clear that no one, whether friend or foe, could mistake its meaning. Thanks to allegory, the critic, so formidable in his immoderate raillery of all ignorant error, could even go so far as to risk describing the methodical plan of the subjects through which the scientific education of young Gargantua was to be developed. To that supreme courage Montaigne could oppose nothing but the irony of his smile. It is by no means unprofitable to compare the lessons afforded by those two lives.

To the doubt of the 'Essays' was added the doubt of Descartes, which, like Pascal's, inspired thoughts and emotions far removed from those of Rabelais. That worthy son of Touraine ploughed a deep furrow wherein syntheses of generalizations could be set out in the virgin soil needed for the establishment of scientific knowledge. It was no-

thing less than taking from the Unknown the management of our own affairs. It represented the failure of the gods. It meant that we took our fate into our own hands. It was the victory of man, master of himself in a world of sensational experience. It was a victory the tendency of which was to enable him through striving for his own personal evolution to perform the share of universal evolution that had fallen to him.

To Descartes, a mathematician not concerned with organic evolution, falls the glory of having opened the field of modern investigation through his search for a rational conception of man and of the world in such data as experience and induction could give him. The idea was remarkably lofty and noble, and required the courage to break with every intellectual convention of the past. And since experimental tests were lacking, his dangerous undertaking was bound in his day to arouse hopes rather than to realize them.

Meanwhile, Descartes's mind, wholly occupied with the absolute conceptions of mathematics, was far from entertaining any idea of being guided by facts. I make no comment on the famous 'whirlpools,' which, under a new aspect, have latterly been recalled to the attention of the learned world. When we assume *matter* and *motion* as a basis for constructing the world, we are asking questions rather than answering them, for no one has ever seen matter without motion, or motion without matter — to say nothing of the famous 'quip' that places immobility at the source of movement.

Descartes made his first mistake when, abandoning philosophic doubt to take sides against himself, he began his study of the universe with the phenomenon of man who is the product of the universe rather than with the coördinations between the two. From that fatal blunder came his unfortunate dictum, 'I think, therefore I am' [1] — a pitfall to students preparing for the Sorbonne. Pascal tells us that the exact text first occurs in Saint Augustine — a fact that no one at first saw any occasion to wonder at.

[1] I *am* thinking, therefore I *am*. There never was a more obvious tautology.

Coming from a Father of the Church, it astonished no one, but coming from a rationalist who had undertaken to revolutionize philosophy, the case is very different.

Indeed, to dare to put aside preconceived ideas in order to consider only the evidence that observation offers was to lay the foundation of scientific knowledge and simultaneously to destroy the authority of so-called dogma. But to take the Ego as the basis of the sought-for reconstruction — that Ego, knowledge of which assumes as a prerequisite a knowledge of the world that produced it; that Ego born of the original ignorance that started our misconception of things; that Ego, child of our original misunderstanding, to which we owe centuries of attacks on our liberty to observe, to judge, and to think, during which we always carried an account with the executioner — to take that Ego spelled defeat at the very start of the enterprise of free investigation!

It is not difficult to identify the cause of that radical mistake. We need only question the philosopher himself at the moment when he expounds the ethical principles on which he relies for rebuilding his house, after having cleared away the débris of the old. 'My first principle,' he writes, 'is to obey [1] the laws and customs of my country, retaining always the religion in which, by God's grace, I have been instructed since my infancy, and governing myself in all things according to the opinions of the most moderate. . . . After having thus convinced myself of the truth of those maxims, and having set them aside together with the truths of faith that have always had the first place in my belief, I considered myself free to try to rid myself of all the rest of my opinions.'

Thus, Descartes, wishing to doubt everything, begins by making an exception in the case of 'truths of faith,' [2] to-

[1] Thus to anticipate obedience is deliberately to falsify the aspect of the problem, since the task was first of all to discover the true foundation of law.

[2] Does not Descartes come near alleging that since we conceive God, God necessarily is, as if articulating a sound were properly conceiving a *summa* of knowledge, when every vocable may be the sign of some misconception or of accepted ignorance? 'The impossibility I encounter in proving that God is not, proves to me that he is,' said even more absurdly La Bruyère, who in complete

gether with the 'laws and customs' that serve as their empirical commentary, and that impose the death penalty on that very freedom of investigation which he wished to teach. Thus, the structure of positive philosophy, lacking any foundation, collapsed at the start. Since no one could make God emerge as the result of any direct observation of the world, which is the source of positive knowledge, there was nothing to do except to question the deceptive Ego, the creation and the creator of vaporous metaphysics, which were ingenuously employed in building up an eternal universe consonant with a passing stage of understanding.

Now that law and those customs expressly excepted by Descartes as not being within the field of legitimate discussion provided the reason why Vanini after having his tongue torn out by the pincers of the executioner was strangled in the great square of Toulouse.[1] Such were the works of that God and of that king before whom the doubt of Descartes collapsed. The soldier-philosopher was in the 'frying-pan,' and the frying-pan was on the fire; the circumstances were such as to make him thoughtful. Eventually it would seem that he tried to put his readers on the wrong scent in regard to his adhesion to the Copernican system.[2] The lesson of the trial of Galileo had not gone for nothing. Descartes preferred to abjure in advance. 'I deny the motion of the earth,' said he, and he spoke with more care than Copernicus and with more truth than Tycho. 'If I seem to attribute some motion to the earth, the reader must regard it as unintentional. . . . I assert nothing here, and I submit all my opinions to the judgment of wiser men and to the authority of the Church.' And in return a good Protestant pastor, minister at the University of Utrecht, took pains to explain that Cartesianism leads to skepticism, to atheism,

ignorance of the organic phenomenon of thought reached this conclusion: 'I think: therefore God exists.' For the credit of our intelligence, it is fortunate that we did not stop at that point.

[1] Merely because a 'witness' declared that he had heard Vanini utter 'impious words.'

[2] Alas, Pascal himself modified his own words in order to range himself with Ptolemy rather than with Copernicus.

and to insanity. The theological Sorbonne also laid Descartes under an interdict throughout the kingdom. Does not all that teach us what an undertaking it is to get thinking man to have the courage to speak his mind?

Pascal was a believer, one of the noblest that ever lived. He wanted to base his faith on his intelligence. He based it primarily on the picture of things which his emotions projected. The trouble is that as a mathematician he demands a strict demonstration, and that as a man of exceeding sensibility he excels in dispensing with proof altogether. In whom and in what could he put faith? Should he trust the direct sensation of God that he found in himself, or the reasoned proof that ended in the poignant injunction to repudiate his mind — most humiliating confession?

The battle between the thinker and the believer is fought out in the man's inmost heart; until he draws his last breath he is cruelly torn by it. His whole life is the story of the convulsions with which the combat of faith, of doubt, and of reason rack his suffering body. Never will he admit to himself that he doubts. Doubt in itself seems the supreme insult to creation, to life, to the conviction that is imposed. And his passionate complaint is that he must ask himself whether his own faith comes from feeling or purely from logic. Are, or are not, our feelings a touchstone as sure as our logic, with its apparatus of demonstration? And, if the thinker finds reason so inadequate that he reaches the point of advising us to become as the animals, that is, to forswear reason, what resource remains except to put blind faith in feeling, the difficulty of which lies, alas, in its dispensing with proof? How near we are at that point to something equivalent to collapse! And all for an eternal happiness or unhappiness that worries us above all else!

It is the easiest thing to understand why Pascal, a mathematician, but preëminently an emotional man, should have been wholly preoccupied with the idea of not being able to reach any rational demonstration, even though he needed no proof for himself. It was at that point that he took refuge in the famous argument of the 'bet,' which is merely

a way of hedging on the undemonstrable for fear lest the dream that stood to the account of reason should prove unable to meet its obligations.

Some persons have written of Pascal's 'bet,' whose sole purpose was to misrepresent its significance. That forcible writer was never so clear or so courageous. He said neither more nor less than what he wanted to say, and he said it extremely well. Brunschwigg, a very learned commentator, has taken pains to explain to us that when the thinker recommends us to become as beasts and to forego the use of reason, he is really asking us to sacrifice an artificial reason falsely raised to the place of a faculty of absolute truth — which in the last analysis is only a compendium of prejudices. No, there is nothing in the bet for or against God that can at any moment suggest those too subtle attempts at attenuation. It would be impossible to find a better example of one man's willfully misinterpreting the words of another. If Pascal had wanted to express the thought that Brunschwigg imputes to him, he was of a stature to do it. He expressed himself quite accurately. It was his logic which stood in his way. He did not cease to humble it, to proscribe it, and he honestly decided that we ought to forego its use even at the risk of becoming as brutes. No one should take from him the credit of his courage.

We are told that the suggestion of the bet came, perhaps, from the Chevalier de Méré, who in a letter to Pascal suggested the idea of a calculation of probabilities. It may be so. Nothing, moreover, could better suit the mathematical mind. 'Let us weigh the gain and the loss of calling "heads" that God is. Appraise the two chances; if you win, you win everything; if you lose, you lose nothing. Without hesitation, then, bet that he is.' These words are authentically recorded. We have no more right to revise them than we have to distort them.

How can any one infer from that text the approximate sum of doubt that existed — perhaps against his will — in the author's mind? I shall not hazard a guess. Pascal's genius was of a strictly mathematical habit; and at the

same time an unusual power of analysis prompted him to resolve problems into their original elements. He had no mental laziness, no halting imagination to stop him in his course. What is to be done when two solutions oppose each other, and when, as he so often repeats, *a choice between them cannot be avoided?* Does the proof that feeling offers us lie in the fact that it demands no proof? Our thinker would perhaps consent to stop there. But the same man was a man of science, and, as such, addicted to experiments in physics, which have no meaning except through proof and counter-proof. Where does the law of proof stop, and how?

Is the same thinker, according to the variable state of his feelings, free either to insist or not to insist that his experiments be confirmed? Or can he try to escape from his embarrassment through logic? In that respect Pascal succeeded no better and no worse than any other man. But he wanted to be able to reason topically, not merely to his own satisfaction, but to the satisfaction of others, and if he dared to repudiate reason, how many others there were who might not follow his example, but would appeal to that same uncertain help! Pascal wanted above all to believe, and the absence of proof embarrassed him less than the idea that strict proof was essential for the sake of others. How could he prevent a persistent anxiety from leaving, in the depths of his morbid sensibility, a painful perplexity from which nothing could relieve him?

Pitiable victim of absolute honesty, he was tossed from the 'miracle' of the Holy Thorn to the mystic amulets, to the hair shirt that tore his flesh. Accessions of unutterable torment cruelly marked the end of one of the greatest minds that ever existed. We shall long discuss the lesson of his life. I have said in complete disinterestedness of thought what I believe I have seen. To believe emotionally and to doubt intellectually at one and the same time, even though the element of doubt is at most barely perceptible, makes a splendid but dreadful tragedy. Convulsed with scruples, Pascal left no dying confession. Did he ever even realize that he had a secret?

In any case, his doubt had a quality so subtle that we can find in it no trace of academic procedure. The man's feelings were too acute to permit him freely to probe to the very bottom of his mind. Philosophic doubt as between one phenomenon and another does not enter into the case. Pascal handles the problem as well as any other man and perhaps better. Here the question concerns rather an unexpressed and inexpressible doubt, but a doubt acutely felt, a doubt originating in cruel emotions in simultaneous contact with experience and faith. If I call attention to the fact, it is because Pascal's personality imposes itself on us, and also because I should not be astonished if the same sensation of haunting discord were not still the fate of mute consciences, to whom it is not given to analyze themselves too closely, and, still less, to raise themselves to the painful standard of genius.

CHAPTER VII

SYMBOLS

IDEOGRAMS

WHAT is that Wheel of Things, that Wheel of the Law which Buddhism, having received it from the Brahmins, made the starting-point of its teaching, because in virtue of the universal correlation of phenomena everything comes from it, as everything returns to it? On Buddhist monuments everywhere the symbol of the Wheel is inscribed, often enclosed between two stags reminiscent of the Deerpark of Sarnath, near Benares, where Buddha gave his first lesson.[1] It is the supreme symbol. But first of all, let us get a clear idea of the nature and function of symbols.

The religious symbol is a representative sign, a schematic image, that evokes some special explanation of the world. Religion had all the more need for an emblem because it sprang from man on his awakening to knowledge when language was in the experimental stage, and the need of something more permanent than oral transmission had not yet resulted in the establishment of writing. As a matter of fact, symbols are the beginning of ideographic writing — engraved, painted, or modeled — which traditionally has maintained itself, in spite of our alphabet. That fact alone is enough to indicate its importance, for in it we find the official records of the earliest thoughts of man about himself and about the world in ages when other means of expression were lacking.

Following these earliest symbols of the first formulated ideas, stone, bone, horn, and wood preserve for us complex designs in which men undertook to represent their most vivid sensations before giving them the form of thought. Long

[1] A small room in which there is a singular platform of masonry *may* actually be the lecture hall in which the first of the four lessons was given. The text of the address in Pali characters is graven on tablets of gold in the temple at Kandy.

ages were to pass before a general agreement of minds on even the vaguest formula for the enigma of things was attained, for before conceiving the dubious solution of a problem, man must be shocked into feeling that here is something unknown, which presupposes that utilization of something known — that is, known proportionally to the degree of success attained by primitive explanation — which ultimately may achieve all that is possible to earthly investigation. At first man was limited to epitomes of doctrine expressed in symbols, which were the first means of transmitting emotion or of knowledge to generations destined to feel and to think on a higher plane.

Even to-day the religious symbol has not lost its essential property, which is to give concrete form to a whole group of generalized emotions that, inculcated by means of interpretative figures, become part of our very flesh and blood. Ask the most indifferent man in any group of persons who have lived for some time in foreign lands whether he has not thrilled at the sight of the symbolic flag of his country, and from his answer judge what the mystics of the quaternary age probably felt at the sight of the amorphous ideogram that represented for them the analysis and the synthesis, the alpha and omega, of that minatory universe which then as now had to be so interpreted that man's moral and material life could be adapted to it.

Our primitive ancestors recorded their 'religion,' their 'philosophy,' their 'formulation' of what they could grasp of the meaning of things in crude images that spoke as clearly to their benighted minds as the emblems of every cult, after centuries of elaboration, speak to contemporary men. When that task of nascent intelligence had once been accomplished, the same ideographs, the same sensations and interpretations of the unknown, appeared in all parts of the earth, perhaps through some form of communication the history of which eludes us, perhaps through the fact that identical problems everywhere produce the same mental states and demand the same course of thought. I advise any one who wishes to be convinced of that truth to read

the remarkable work of Goblet d'Alviella on 'The Migration of Symbols.'

CONTACTS

On the cliffs of the quaternary age are engraved the most ancient ideas that startled thinking humanity. Consequently, an attentive study of religious symbols from that period down to our own allows us in part to reconstruct the spontaneous beliefs of the first ages and to follow the developed idea back to that original source in which the secret of our earliest improvised explanations lies hidden.

Man instinctively adored everything that was useful to him. The stick that he chanced to pick up,[1] and that he soon afterwards deified as an instrument of power; the club;[2] the stone utensil; the tree that sheltered or nourished him; the tree of life, with its regenerating essence; the tree of knowledge, from which came the inspiration of dreams, with or without the approval of the serpent to whom in his deep hole the secrets of the earth were revealed; the gushing fountain; the rock that impressed us by its mass and by its shape; the animals we had to fight the more boldly, since not only animal but human flesh was at stake — of which the latter was a precious comestible in menus, the memory of which is preserved in the communion service, perverted even now to the extreme of *theophagy*.

Later, perhaps much later, because in the beginning animal habit made astonishment impossible,[3] man began to deify the sun with the sky and its stars — objects of his terror and of his gratitude; the earth, with its moving waters; the roar of its seas; its winds and tempests; its dominating mountains; its living species from the lion to the ape, from the eagle to the scarab, to say nothing of the monsters to

[1] It became the scepter of kings, and even to-day is especially revered in China.

[2] From which the mace, symbol of power, is derived.

[3] Attention — the concentration in a single effort of various mental activities — is the reverse of astonishment. Astonishment presupposes the incoherence of observation when put off the track, whereas familiarity necessarily makes man feel the need of explanation.

which India still pays its greatest homage. There were gods of good, gods of evil; gods of everything good and evil together, to whom it was necessary at every moment to offer sacrifice and prayer. Confusion reigned; the diversity of the paleolithic symbols attests that that doctrinal order was lacking, which religious systematization later developed into flourishing cults that expanded according to the time, the place, and the emotional capacities of the people.

To-day we see all that confusion of beliefs in the more or less doubtful expositions of the subject which seek to justify reflexes of immeasurable antiquity that led us into intellectual blunders. In the beginning, religion was an impulse, a need to speak in order to assure ourselves a happier life. It represented the urgent need of an idea as a preliminary to knowledge. Such as it was, the symbol had its share of common veneration by the same right as did the divinity it represented.

THE SOLAR DISK: THE CROSS

We know nothing of the first incomprehensible symbols; we can see nothing in them except the stammerings of sensation. Such are the sketches at Gavr'inis; they seem to be the first appearance of a desire to express no one knows what — perhaps the first flutter of an idea. But after a time the picture grew precise; a circle appeared, representing the solar disk. A cross was inscribed within it, as for example in Assyria, where the cross became the ideogram of the god of heaven. The cross is one of the most ancient symbols in this incredibly tangled story. The transverse bar is supposed to indicate the course of the sun [1] intersected by the vertical bar that goes from north to south. It was a primitive token of the four cardinal points. 'The cross of the South American tribes,' says an explorer, 'is a veritable compass card.'

Chaldeans, Indians, Persians, Greeks, together with the

[1] That might also explain why the transverse bar, representing the course of the sun, later represented the earth, as exemplified by the belt on the surface of the planet successively lighted by the divine torch as it passes.

Gauls and the aboriginal tribes of the two Americas, used the same equilateral cross, the arms of which sometimes end in an arrowpoint, as if to indicate the course of the solar ray.

The equilateral cross is universally known. I have encountered it in the Palace of Gnosos (called the Temple of Minos) in Crete, together with the lily, and also in ancient Greece on vases of contemporary use. When the Spaniards found the equilateral cross among the Indians of South America they simply inferred that the new continent had been evangelized before they discovered it. In China, in contrast to the curve of the celestial vault, the earth, always reputed to be flat, is represented as square. The equilateral cross inscribed within it has an important cosmic significance. Again, the disk of the sky, surmounted by the cross, is the exact image of the Christian globe which until quite recently the statues of our kings bore in their hand. That arrangement may perhaps imply a linking of the suggestions of a systematization of forces. The most ancient equilateral cross is found in the quaternary caves, and the most recent is even to-day a part of the signature of our parish priests.

The cross formed of two mallets belongs to the Egyptians, the Celts and the Germans, who, through the metaphor of the creative shock, make of it the symbol of life and reproduction. The cross composed of double gallows, which survives in the Greek letter *tau*, is found in Palestine, in Gaul, in Germany, among the Phœnicians and in Central America. The prophet Ezekiel tells us that it was a symbol of life and salvation.

Later, some modification in the design converted it into an ideogram of lightning. Everywhere the sign necessarily alters with the thought. Among the Celts and the Germans the celestial mallet with the two heads becomes the emblem of vital power, precisely as the cross of Christ became identified with the tree of life, symbol of symbols, which we find duly recorded in the Bible. We find the cross potent or Jerusalem cross even in the Christian catacombs.

It goes without saying that our present Christians do not admit the relationship of these signs to their own symbol.

The fact is indisputable, however, that we meet the symbol of the cross in the majority of cults. The Christians successively adopted the Gammadion,[1] the cross potent, and the equilateral cross before accepting their actual symbol, which is purely schematic, since we have no information of any kind about the instrument used at Golgotha.

The more eager we are to regard these manifestations of human thought at its beginnings as independent of one another, the more rigorously are we forced to a contrary conclusion, for the simultaneous appearance of like symbols in every land clearly points to like attempts at explaining the world.

Nothing is so contagious as a symbol, and, moreover, no one ever adopts one without attaching to it something of the virtue of a talisman. And so the symbolists of the first ages, the makers of circles, of crosses, and of all the other signs about which I can say only a word in passing, understood the matter. The subject deserves fuller treatment, for our minds are still perplexed by these figures which exist everywhere. What surprises there are in these fountain-heads of history! Could any one guess, for example, that the coral branch and the sign of the hand that usually accompanies it came to Naples from far-away Chaldea, where the horns of the bull were the symbol at once of reproduction and of dominating power?

THE SWASTIKA

However, we must pass from the 'motionless motion,' as Aristotle says, to the symbols that express motion. The arms of the cross that end in arrow-heads, and also the rays radiating from the circumference of the disk, were forms representing motion. As the rotation of the sun was unknown, its apparent journey across the sky and its regular daily return led to the more exact symbol, the Gammadion, or the famous Swastika that stresses the continuity of motion by giving each arm of the cross a rectangular bend from left to

[1] Gammadion, because it is composed of four gammas (the Greek letter *g*) joined at their feet.

right, that is, as the sun travels. Thus, the figure represents the rim of a revolving wheel. The wheel is what started human minds toward the principal symbolization of that eternal succession of existences of which Buddha, adopting the metempsychosis of the Brahmins, made the culminating point of his doctrine. It is not surprising, then, that as a complement to the Swastika, the Sawastika, the arms of which bend in the opposite direction, came to symbolize the course that the sun takes *after* it dips below the horizon, and that permits it to overtake the dawn of the next day. Thus the symbol of the Wheel was completed.

We meet with the Swastika among all the peoples of history and in every age, except perhaps in Egypt, Assyria, Phœnicia and Chaldea. It is the supreme Aryan symbol.[1] It is said to have gone from Greece to India. It may be so. In any case, it reached China and Japan from India.

Inevitably it underwent changes, the most significant of which was putting a second bend at the end of the first, so as to give the eye a more lively sensation of accelerated motion. The impression produced by the added bend in the hook was fully as great, and when the *tetrastyle* became the *tristyle*, each bar so vividly portrayed a running leg that we still find in the feudal coat of arms of the Isle of Man (which, like Sicily, is triangular) the three legs joined at the top of the thigh, as on the oldest coin of Lycia. Sometimes

[1] It is claimed that the Gammadion, or Swastika, common in China and known everywhere, is the Indian Arani — the apparatus used for making fire by rubbing a point of hard wood in a groove cut in a piece of soft wood. I am inclined to think that an error. In the Egyptian Soudan and in India I have often seen the natives use the Arani, though always at my request, for it has generally been supplanted by the ordinary match. The native to whom you address yourself picks up any chip of hard wood and any chip of soft wood, first sharpens the hard wood to a point, then cuts a groove in the soft wood with his lance, and the rapid friction produced by the play of his two hands quickly strikes a spark. I cannot find even a trace of anything symbolic in the whole affair. The cross, whether Gammadion or not, seems to have no connection with the matter. Why the complicated apparatus, requiring a certain amount of labor to make, when one need only pick up a couple of dead twigs? We are told that the gamma-shaped bends serve to fasten the apparatus to the soil. It needs no fastening; the soft wood is simply held in place by the energetic friction of the hard point. The bend, however, may indicate the rotary movement needed to produce the fire.

the foot of each leg ends in the head of a cock. Thus the bird whose crowing salutes the rising sun appears to have been raised by the pagans to the rank of a solar symbol before it came for the same reason to take its place on the bell-towers of our churches and from them to send forth its Christianized call to the ancient god of dazzling light.[1]

However, the Swastika adorned the city of Priam, and Apollo wore it on his breast. It ornamented, not only the chair of Saint Ambrose at Milan, but also the dalmaticas of the primitive Christians. It is the sign of salvation, the supreme lucky piece. 'Su asti,' says the Hindu, and the Greek, 'Eu esti.' In French, 'vœu de bien.' Here, at last, was a ground of universal understanding. It was not much in view of what was bound to follow. It may be better than nothing, if the day is ever to dawn when men will discard the incoherence of primitive dreams and agree on a scientific interpretation of the phenomena that produced the symbol. That day is not yet here.

Later still the Gammadion was flanked with the lunar crescent, probably through a blending of two cults. Sooner or later came the decadence of symbols, which changed and became hopelessly confused —

'When religions ebb like the ocean tide.'[2]

Like all things human, our gods, which are born of ourselves, can but appear, wax, wane, and die. They are a glory of the world that has passed, an evolution that has reached its end. Bow to their memory!

I cannot deal at length with the Swastika's rival, the anserated cross of the Egyptian monuments which is known as the Key of Life, and which was long in developing. It is enough to note here that the Egyptian symbol corresponding to the Swastika is the winged globe which by another

[1] On the bell-tower of a village church not far from my house in Vendée there is a radiant circle of the solar disk, surmounted by the cock that announces the coming of day — the primitive emblem of a Pagan cult absorbed by Christianity.

[2] 'Quand les religions baissent comme la mer.'

combination of signs represents the same phenomenon of the moving sun. Each symbol has its history; we have not time to discuss them.

THE TREE

More than all the other symbols, the tree of life and the tree of knowledge have many points in common. In India the unconquerable tree with its humanly wrung arms expresses an outpouring of energy that compels admiration. Now, to our remote ancestors it was but a step from wonder to worship. The pillar of the world, typified by the shaft of a column that is nothing but a copy of the trunk of a tree, and the sacred tree itself seem to come from the Assyrio-Chaldeans. India insisted on claiming them for herself. 'What is the wood, what is the tree on which heaven and earth have been graven? Brahman (the universal soul) was the wood, Brahman was the tree on which heaven and earth have been graven.' [1] Is the cult of the tree perhaps a memory of the far-off days when our anthropoid ancestors still lived in them? The idea may seem far-fetched. The tree is often associated with the peacock, the lion, the goat, the griffon, and man. In intaglios the serpent is commonly found in its company. Syria shows us two men dancing under a palm tree and plucking the fruit. India was ardently devoted to the cult of the tree, and Buddhism powerfully supported it. Of that, more later. In every Indian village people adoring trees surrounded with sacred stones painted red are a common sight. One should not overlook the tree under which Buddha came into the world as soon as his mother, Maya (illusion), had seized the blessed branch. And, finally, we must bear in mind the tree (Djambu) whose shadow remained stationary above the future Buddha,[2] although the sun in its course made the shadows of all the other trees move. And, to conclude, there is the ever-famous

[1] Rig Veda.

[2] At the feast of agriculture at which the king, father of the prince destined to become an ascetic, himself ploughed the symbolic furrow, which he left at sight of the miracle in order to adore his son.

Bodhi-tree (tree of knowledge) under which Siddhartha received illumination.

Eusebius says that the Phœnicians worshiped the plants on which they fed. He had not foreseen that his own cross would in due course become a *super*-symbol as the tree of universal life.[1] From Persia comes the tradition of Haoma (Soma of India), an alcoholic liquor derived from the *asclepias acida* and, together with clarified butter, serving to feed and perpetuate the fire of the altar by the sap of the tree of life that confers immortality. Babylon, before receiving its present name, was called 'the place of the tree of life.' In the Assyrian language the vine was called the 'tree of life.' We have the survival of the name in the term *eau de vie*.

We are quite familiar with the incident of the tree in our Garden of Eden. We cannot help comparing with it a Chaldean picture representing the sacred tree between two persons. One, who is certainly a god for he is adorned with the horns emblematic of power, is making a forbidding gesture over the mythical fruit, which a woman is stretching out her hand to pluck. The other is the serpent. Erect on his tail, he raises his head above the woman's as if to urge her on. Can one imagine a clearer outline of a plot?[2]

Again, there is a painting on a Greek vase. It represents the expedition of Hercules to the Garden of the Hesperides, in which we see two of the Hesperides tricking the serpent-guardian of the immortal apples of gold. Wrapped round the trunk, the poor 'dragon' forgets himself so far as to drink from a cup that is held out to him by a treacherous hand, while the accomplice plucks the poorly guarded fruit.

[1] The vertical line of the trunk and the commanding power of the horizontal branch, so remarkable in Indian examples, suggest something like a meeting of the bars of the cross.

[2] The two serpents that face each other on the caduceus, stone images of which I have found in India, perhaps express the primitive conception of the powers of good and evil fighting for possession of humanity. Always the same tragedy! At Seringapatam, near the ramparts where Tippu Sahib fell sword in hand, I found at the foot of trees alive with monkeys an accumulation of small columns representing the traditional caduceus. It was an asylum of live serpents best left undisturbed.

It might be termed an anticipatory revenge for Eden, where the ingenuousness of our mother Eve was the divinely contrived source of so many troubles for her descendants.

At Cyprus (Phœnician) and in Egypt have we not actually seen the sacred lotus flower (in the highest degree symbolic) blooming on the tree of life? The lotus, which opens with the rising sun and shuts at its setting, though it has belonged to many another cult, has remained the special symbol of the Buddhists. If the symbolists of the tree of life seized upon the lotus, perhaps the more eagerly because, owing to its appearance, it was as much the ideogram of reproduction as of the course of the sun, the reason is that symbols, like the myths embodied in them, have not ceased to intermingle, to lose their special character through overlapping one another, and to amalgamate and fuse as their original significance kept growing less distinct in the night of bygone ages.

The symbol itself thus degenerated into a summary of confused secondary meanings, ended by having no value except as a sign, and became transformed into a simple alphabetical character. It is common knowledge that originally the Greek *alpha* was the sketch of a bull's head.

The Chaldeans regarded the universe as a tree. The massed foliage above represented the sky; the stars were golden fruit; the roots symbolized the earth into which they were sunk. The Vedas used the same imagery. Chaldean philosophy made of the tree a solar emblem, and India also delighted in giving it a metaphysical significance.

The Greeks were content to interpret as oracular the sound of the wind among the leaves of the oaks at Dodona (with its Semitic doves), the most ancient sanctuary of Greece, Phœnician in origin, and served by the 'barefooted Selli' — a fact that may point to an Indian tradition.

Mesopotamia knew a lunar tree. The Apocalypse likewise places in the middle of the heavenly Jerusalem 'the tree of life that bare twelve pieces of fruit, one in each month of the year.' Finally, China made much of a tree of

life, which was of jade, and the fruit of which conferred immortality.

I should need many more pages to mention all the forms of the tree of life that were current among the Aryan, as among the Semitic peoples, and that especially in India were connected with the tree of knowledge (Bodhi), under the foliage of which Buddha received illumination. I have had the pleasure of seeing at Ceylon the 'direct' scion of that tree,[1] and I can testify that it is indeed the tree of life, both for the monks who receive the offerings of coin and for the monkeys that eat the rice offered to the god. Although they regard life as an evil — I speak of the monks — obviously all they have to do in order to find considerable advantage in it is to make good use of a symbol.

The Biblical misfortune of our first parents was that since, as Jahveh remarks, the fruit of the tree of knowledge would make them 'capable of discerning good and evil LIKE ONE OF US,'[2] access to the tree of life was likewise forbidden them by the universal creator, lest they should happen also to achieve immortality. Had our mother Eve but sinned a second time we had possessed both knowledge and life eternal! Many persons will never be consoled for that oversight.

And while I am dealing with the symbolic tree, I cannot avoid mention of the famous 'tree of liberty' which our wild revolutionaries of the year II found somewhere, and of which they made an emblem of their bloody pastorals. A patient investigator might, perhaps, follow the thread of connection between Genesis and the Convention and tell us how Moses led us to the Goddess of the Red Cap.[3] There

[1] To which three hundred years before our era Mahinda, son of the Buddhist Constantine, the great Indian emperor, Asoka, brought it.

[2] Is not that phrase *one of us* the simplest answer to Renan's assertion that the Semitic people were originally monotheistic? And it should not be forgotten that 'Elohim,' which is plural, is supposed to designate the Divinity. It is appropriate perhaps to call to mind the remark of Manu: 'The universal soul is the assembly of the gods.'

[3] Red bætyls in India, red cap and red flag in the Revolution — all three are emblems of the sacred fire in the glory of which the gods live.

is a page of history to elucidate! In many villages we still find revolutionary oaks and elms that the wind of reaction has not uprooted, for the sole reason, I fear, that no one any longer knows what they used to represent. In 1848, when I was a child, I saw a handsome chestnut tree ceremoniously planted on the Place Royale at Nantes, which in course of time became the Place du Peuple. Fournier, curate of the Church of Saint Nicholas, and later Bishop of Nantes, gravely blessed it. Legend would even have it that later on he used a bottle of vitriol to give an edge to his blessing. Both priest and tree are dead. I might have predicted it. As for liberty, I have to admit that people continue to talk of it.

THE BÆTYLS OF ASTARTE

I can mention only in passing the conic bætyl,[1] which is the symbol of Astarte, Mylitta, Darcito, Tanit, and Anaitis (great telluric and lunar goddess of the Semites), which we find also on the coins of Paphos, of Byblus, and of Sidon. We see it amalgamate with the disk, whether winged or wingless, in such wise as to come to resemble the anserated cross of Egypt, which, says Goblet d'Alviella, far antedated the Phœnician representations of the great goddess, virgin and mother, murderess and regeneratrix, who appeared among all the Semitic nations as the highest personification of nature in its double aspect of cruelty and beneficence.[2]

We see how the interpretations, which symbols are intended to fix, made their way little by little along converging paths. There is here so much margin for suggestion that, when I first saw in the Louvre the symbol of the Carthaginian Tanit — an isosceles triangle surmounted by a transverse bar [3] on which rests the solar globe — I immediately

[1] The bætyl, properly speaking, is the stone that was swallowed by Saturn (Cronos) instead of Jupiter (Zeus), his last born, and that, disgorged by the father of the gods, happened to fall at Delphi, the center of the earth. All the sacred stones that became objects of worship, or that are reduced in every land to the simple rôle of talismans, are the derivatives of the bætyl.

[2] Like the Kali of India.

[3] This, as I have said, may be an ideogram of the earth. The hooks that

recognized in it the outlines of a feminine silhouette. In Phœnicia Renan likewise thought he discerned in it a praying woman. And, as a matter of fact, that transformation antedated the Græco-Pelasgic columns from which the famous Artemis of Ephesus with the innumerable breasts is derived.

By then the anserated cross had reached Mesopotamia, and in Egypt the first Christians inscribed it on their temples in order to distinguish them from those of their co-religionists who set up the Greek or the Latin cross.

It would take too long to tell even the briefest story of the winged globe, which, with its flying scarab, spread from Egypt through the whole of Asia. The symbols of the sun, of whatever sort, were one after another insensibly transformed into representations of the Supreme God, embodying the generalization of a cosmic Providence. Study of the migration of symbols has shown that, after the exodus from the Pamir, and long before the Greeks of Alexandria, the India of our Aryan fathers had received from the valleys of the Nile and of the Euphrates, across Assyria and Persia, a stock of primitive cultural ideas which it developed along its own lines. It would take me too far afield to discuss the aureole of our saints, which came from Assyria,[1] and which represents the sun, nor have I time to speak of the winged caduceus of Hermes that reached India from Greece, nor of the Buddhist 'Tricula,' another solar symbol, which was transformed later into a trident. Similarly, the Phallic cult was carried everywhere by means of its symbol. Egypt, Syria, Phœnicia, America, Greece, and Rome show us the

terminate the bar at each end represent in certain images the arms of the idol, and the solar sphere represents the head. Was not the image consciously derived in that way? As the schematic lines of the symbol coincide with those of a simplified female figure, one does not have to stretch the imagination to see in it a representation of the goddess. A careful examination of many figurines seems quite to corroborate this idea. This might be the actual formation of the gods as they came into being.

[1] The gods live in the sun. A stain of red paint on a stone is still enough to make of it a god for the emotional Indian of our times. The aureole seems to the Indians so indispensable for a god that when they deified Hanuman, the king of the monkeys, they made one for him out of his tail.

symbol embodied in emblematic figures, to which primitive innocence perhaps attached no unclean thought. India, with its Lingam and its Yoni of every size, preserves the cult of universal generation in a serene religious simplicity.[1] At Ellora and at Tanjore, as well as in the displays of copper articles in booths throughout the continent, the phallus awakens no sentiment except that of edification.

I have spoken particularly of Asia because from the remotest ages to our own times, its thought, its rites, its cults, its philosophy, and its metaphysics have invaded Europe and have grown luxuriantly. We feel at home with them. The superstitions and the sorceries of old Asia are still ours. It gave us its last Messiah, and with black ingratitude we have cursed, persecuted, and tortured the people of whom he was born. I admit that that people had put him to death, but how can we fail to congratulate ourselves on the fact, since without Golgotha we could not have been saved?[2] Great were the massacres of our brother Christians which ensued! Can we properly repudiate the intolerant synagogue after having so freely copied it?

Egypt is not so near to us as Asia, although for a while its religion took root in Roman soil. But Christianity swept every rival god before it, and for us Egypt is consequently no more than a magnificent colonnade that affords no vista toward the future Europe.

Remains the Far East, a *terra incognita*, where an intellectual activity unsurpassed on any continent of the earth developed. Therein is, perhaps, the source of our finest intellectual efforts. We have seen the China of our first centuries go to India for the pure faith of Buddha and then incorporate it in its own hereditary religion. Would it be a stranger thing if, before Fa Hien and Hiouen Thsang, other

[1] Women, before they go to till their fields, model the phallus with their hands and offer to it a flower and a libation by way of worship.

[2] Divine charity needed the noble sufferer of the cross in order to assure us a salvation that does not save us from hell in case we sin. Hence we must infer that before Golgotha we were reserved for eternal torture, however virtuous we might be. In any event, the Jewish people are doomed to eternal damnation.

missionaries from the Far East, reversing their feat of propaganda, had brought from their own China rites or cultural symbols, together with the doctrines that may have been attached to them? In the third century before Christ the missions of Asoka in Egypt, in Asia Minor, and in Epirus present notable examples of such propaganda. There was this difference, however: unlike the last Chinese missionaries who went to seek Buddhism, the great Indian Emperor tried to export it.[1]

We cannot resist the idea of such a previous mission when we meet the cultural symbol of the cock everywhere in use throughout the Far East. It is very natural that primitive imagination, seeking the moving causes of the world, should evoke whatever reminded it of the bird whose crow hails the rising sun. The same causes everywhere produce the same mental phenomena. Is it not on some such principle that the pagan cock, derived from Asia Minor, has succeeded in perching itself on the spires of our Christian churches to welcome with its clarion call the light of day, and that in China it fills an analogous rôle in other figurative ways? [2]

Such, again, is the case of the symbol of the cross, inscribed on the walls of the paleolithic caverns and everywhere found among the original emblems of every continent. In the eighteenth century the frequent presence of the cross among Chinese characters so struck a learned French missionary, the Abbé de Prémaré, that in good faith he expended the treasures of his erudition in an attempt to reconcile the Bible with Chinese beliefs. The same is true of the solar wheel of India, which we find everywhere in the Chinese Empire. I have already pointed out that symbols represent a primitive attempt at ideographic writing, and that they accordingly give us the first indication of the ideas that our ancestors formed in the course of their quest of a formula for

[1] In this he succeeded better than in his continental propaganda. Even if the Buddhist conquest of Ceylon by his son Mahinda was permanent, the teaching of Sakya Muni has completely disappeared from India, not, however, without leaving an undeniable impress on its Christian substitute.

[2] In China, for example, the pupil brings a cock to his teacher who is supposed to scatter the shades of ignorance.

the world and its inhabitants. What could be more natural than to find identical phenomena producing, in the reactions of similar organisms, identical analogies?

Every one knows, nevertheless, that the peculiar characteristic of the Far East lies in its combination of emotional and intellectual traits, ethnically distinguished from ours, not only by the interpretation of phenomena, but by the subsequent development of the interpretations. The Oriental mind and ours followed a notably divergent course toward their eventual meeting place. Hence it is not surprising that the cock, whether autochthonous or not, became lost in an inexpressible turmoil of Far Eastern symbols, created by modes of thought only too likely to mislead us. We must be patient if we are not to lose ourselves in this ocean of subtle refinements that seem to lead to the total evaporation of thought. And yet, the Chinese interpretative procedure keeps so close to our own that it succeeds in outstripping it.

Consider the most notable Chinese symbol. The Tai Ki (Great Extreme) is a circle in which are inscribed two apparently gyrating half circles twisted together head to tail like the tadpoles in our marshes. The circle represents the sky, and the little disk at the center of the enlarged end of each of the two half-circles (which indicate respectively the sun and the moon) might easily represent the eye of the embryo. The figure symbolizes the alternation of day and night, cold and heat, good and evil, motion and repose, life and death, and I know not how many other things. Everything proceeds from it, and everything returns to it. It is the supreme formula of the universe.

Its analogy with the generative dualism of the Avesta has called forth a host of commentaries. The Yin and the Yang, the two gyrating figures that compose the Tai Ki, also represent the male and the female principle by which the world was engendered, and to that extent at least are a generalization analogous in their history to our own, since it converts the cosmic formula once more into an expression of the phenomena of life — a theory now discarded. With that symbol as a starting-point, the Chinese mind gave itself free

course. The cosmogonal, philosophical, therapeutic, and divinatory systems founded on the Tai Ki everywhere produced, and are still producing, offspring. The Yih King, the most ancient book of the Chinese, which is supposed to have been written three thousand years before our era, can supply us with ample material for the study of the origins of thought.[1]

We cannot fail to compare that ideographic symbol with the solar Wheel, and especially with the Swastika, the function of which is also, as I have said, to evoke the sensation of the moving sun. Is it not remarkable that, like the best qualified modern science, the utmost effort of the first human minds, traveling along different paths, should all have united at the end in identifying the whole system of the world with motion?

An entire life would not be too long to recount the history of Chinese symbols, which represent an intensive cultivation of a generalized ideography. The fact is clearly shown by the extraordinary diffusion of the emblematic characters, Thuc and Tho, which symbolize happiness and longevity, and Loc, which often accompanies them, and which signifies prosperity. The pomegranate is a symbol of fecundity. The peach, the tortoise, and the crane are symbols of longevity; the dragon is a symbol of power, etc.

Finally, I should mention the Kua, a figure composed of eight trigrams, which is sometimes associated with the Tai Ki, and which, through combinations of broken or continuous lines, expresses all that we can conceive of man and of the world in every division of thought, and especially of imagination.

THE WHEEL OF LAW: THE WHEEL OF THINGS

How ought we to interpret the symbol of the Wheel of the Law, or the Wheel of Things, to which the teaching of Bud-

[1] The Yih King is the most ancient book of the Chinese, saved by the contempt felt for it by the emperor Tsin Chin Hoan, when he had all books burned, and, moreover, massacred the whole educated class — a custom that, with no help from any Chinese missionary, our Christian Church has so warmly welcomed. There exist in China 1450 works that take a keen delight in explaining the Yih King in as many different fashions.

dha incessantly refers us? The symbol was derived from the Brahmins, for the famous imprint of the foot of Buddha (the bas-reliefs of Amaravati) that carries the image of the Swastika, of the Wheel and of the Tricula, was originally the reproduction of the foot of Vishnu.[1]

The Wheel was derived from the discoidal image of the sun, but necessarily a late image, since, to arrive at it, some sort of wheeled chariot had first to be invented. If the makers of the Swastika had known the wheel, they would not have needed their cross with its bent bars to indicate the course of the sun across the sky. The sensation of movement seems to have preceded that of the object which the imagination alone can make stand still.

To-day the theory of the wheel seems simple. The first person who conceived the idea was a great benefactor. I have often thought of him on seeing what were wheels in intention but hardly in fact jolt over the roads of India and the trails of Burma, drawn along by gently trotting small blue cows.

It took a long time for the imagination of a poet, searching for a metaphor, to conceive the simile of the sun in his chariot from seeing a man jolting on the rollers of a springless cart. However, as soon as the resemblance was seen, the Wheel acquired inexpressible dignity and assumed a place of honor in the temples to which man, for his own pleasure rather than for his god's, brings what is most alive in his poetry, in his songs, and in his ceremonies.

I see no reason for comparing the Wheel, as some symbolists do, to the prayer-wheel, which is a cultural mechanism used for the convenience of man in his relations with his gods. Our Christians have gone no further than litanies. The symbolic Wheel of the World should be interpreted quite differently. It aims at nothing less than reproducing the figure of the sun in sign of human participation, even of

[1] It is the Brahmanic symbol of the 'Real Presence,' transferred from Vishnu to Buddha, as we see from various monuments in India. Similarly, we have the imprint of the foot of Buddha at Ceylon (Adam's Peak), and also that of the foot of Saint Paul on the rock of the Areopagus.

human aid, in the movement of the sun in its course. Hence the circumambulatory adoration in which the worshiper is required to walk in a circle, going with the sun. Many ritual practices have survived therefrom [1] among the majority of peoples, including that of walking in a circle from left to right.[2] I have noticed the practice in Brittany on the days of 'pardons.' In India, at the funeral piles of the great crematory of Bombay, the members of the family, carrying torches, circle around the first smoke before leaving the dead to his fate.

One day, from the top of the fortress of Bikanir, I watched a woman quickly circle a tree. As the roots protruded above the ground, the act taxed her agility.

'What is she doing?' I asked my friend the rajah.

'She is asking something of her god,' he replied placidly.

Baber, the Grand Mogul under whom at the end of the sixteenth century Islam achieved the conquest of India, twice mentions this cultual practice in his Memoirs as follows: 'At the spot where Said Ali Hamadâm died there is now a funerary monument, around which I made the circuits prescribed by religion.' Again, farther on: 'I entered the room where his son Hamaiun — who was threatened with death — was, and I circled three times round him, starting at the head and saying, "I take on myself all that you suffer." At that instant I felt heavy and dull, whereas he found himself light and alert.'

[1] 'No one,' says the Abbé Huc in his *Voyage au Thibet* 'can help being struck by the similarity between Buddhistic ceremonies and those of Catholicism. The Cross, the mitre, the dalmatica, the cope, or pluvial, worn by the Grand Lamas when traveling, or when conducting some ceremony away from the temple; the antiphonal singing, the exorcisms, the censer supported with five chains that can be opened or shut at will; the benediction given by the Lamas by placing the right hand on the head of the faithful, the rosary, the celibacy of the priesthood, spiritual retreats from the world, the adoration of saints, fasts, processions, litanies, holy water — how many similarities there are between the Buddhists and ourselves!' 'He might have added to his list,' says Max Müller, 'the tonsure, the veneration of relics, and the practice of confession.' I in turn have noticed that the saints of both have aureoles.

[2] In Homer Achilles and his Myrmidons turn three times around the funeral pyre of Patroclus. The whirling dervishes declare that they whirl for the pleas-

Why be astonished? Some walk in circles, others seat themselves or fall on their knees. The result is the same — a fact that discourages no one. Moreover, all believe that they are accomplishing an important act of their life and avoid one another because they differ in their gestures, although they no longer know what their gestures signify.

The uniqueness of the circumambulatory rite which is Brahmanic in origin, lies in the fact that it not only propitiates divine caprice (which Buddha disregards), but expresses the system of things — a system of which the characteristic point is the unbreakable chain of phenomena [1] from which the Buddhists think man can escape only by piling up 'merits' ultimately rewarded with annihilation.

Thus, by a material extension of the symbol, the Wheel was raised to the rank of a superior representation of the universal order and became the sign of the reign of law. That word alone, put in the place of the divine will, proclaimed the decisive revolution which discarded divine caprice and substituted for it the inflexible order of a determinate world.

However, if Hindu metaphysics could succeed in rationalizing the symbol, the liturgical usage easily passed into many divergent forms. The sun-wheel exists in the cultural metaphors of Greece, where it forms the torture of Ixion. Lucretius sings the flaming orb. Among the Scandinavians, among the Celts, in France even to-day, in England, and in Germany, the wheel is associated with the rite of fire. We find it on the Column of Toulouse, and also on numerous Gallo-Roman altars. At the summer solstice the fiery wheel of Saint John is carried through our fields to close a circumambulatory rite. The Wheel of Fortune has remained in our language, and I have seen that same wheel ornamented with bells in a church in southern Brittany where in certain ceremonies the faithful spin it to win a happy lot.

ure of Allah, who wishes that everything in the world shall turn. In Catholic funeral rites the officiating priest also turns around the catafalque.

[1] That is the ultimate conclusion of modern science, and Buddhism can claim the honor of having anticipated it.

Contrary to former belief, Egypt seems not to be the first country to have used the symbol of the Wheel. Buddhism, which seeped into Asia Minor three centuries before Christ, was manifestly one of the principal disseminators of the Wheel. Through the agency of Buddhism we find it also in China, and in Japan. On an Egyptian tomb of the Ptolemaic era is the image of a circle with four bars accompanied by a trident—derived from the Buddhist Tricula, the primitive symbol of the Hindu trinity, Brahma, Siva, Vishnu. The presumption is that a Buddhist temple existed at Alexandria.

'By a sort of recoil,' says Goblet d'Alviella, 'the liturgical wheels, perhaps invented by the Brahmins, may have come to be superimposed on the traditional solar symbolism that the western Aryans had retained as a result of the old Indo-European unity. Did not the same thing happen later to the Vedic cult of Mithras?' The infusion of Buddhist rites into Christianity can no longer be disputed, especially since we actually have the edict by which Asoka sent his missionaries — monks, physicians, etc. — into Syria, into Epirus, and into Egypt.

Furthermore, the latest investigations carry us back again to Chaldea. A bas-relief in the British Museum, celebrating the restoration of a Chaldean temple of the sun toward the year 900 B.C., portrays the worshipers of a god who holds a disk superimposed on a transverse bar that in the symbol of Tanit represents the earth turning a wheel on the altar. It actually seems that with or without the help of Egypt, Chaldea originated our most important symbol of divinity. However that may be, it was the astonishing metaphysical skill of the Indian mind that carried the ideogram to the extreme of refinement in interpretative symbolism.

The Rig Veda calls upon the god who guides 'the golden wheel of the sun among the uneven [1] clouds.' That god, by whatever name he is called, is the sun itself, symbolized by the wheel of his chariot, 'the wheel with triple hub that nothing stops, on which all beings rest' — plain symbol of

[1] A suggestion, perhaps, of the earliest roads of India.

cosmic motion that, indeed, nothing interrupts. How could the transition from the primitive conception of divine caprice to the notion of a Law governing the unbreakable chain of phenomena, be more clearly marked? And that its deep significance may not be mistaken, the Buddhist text of the Bharma Chakma tells us of the 'Wheel of the Law made of a thousand spokes, darting a thousand rays that, once started into motion, can be arrested by no one — man, priest or God.' Cosmic law is set above divine caprice.

Buddha, in teaching his favorite disciple Ananda, concluded with the injunction that as a matter of practice he place at the door of the temple a wheel to represent the circle of existence, and that he explain to all comers its supreme significance. A bas-relief at Buddha Gaya, where Sakya Muni received illumination from Buddha under the fig tree (Pipal), the tree called Bo, the tree of Bodhi (the tree of knowledge), depicts the wheel in action; and innumerable statues portray the divine man through the power of his sermons setting the wheel to revolving, that is, acting in harmony with the nature of things. A cycle of existences, a flow of phenomena — such is the explicit conception of the Indian mind, and our scientific researches have at last caught up with it after some thousands of years.

What even now is obvious is the profound identity of all the cults that have spontaneously sprung from man before the spectacle of the universe. I refer quite as much to rudimentary minds condemned eternally to mark time as to the mentalities prepared for the progress of evolution. So decrees the organic uniformity of the human understanding, which under identical conditions leads us to ask identical questions, and, infallibly, to receive a succession of identical replies.

So far as it is possible for us to know, the man of Chapelle-aux-Saints, scarcely more developed than *homo erectus*, had not yet gone far in his enquiry into the environing world. At least the formation of his cranial cavity suggests a doubt. But as soon as men felt the need of recording their sensations of things in definite form, their like assimilation of the

facts was enough to elicit like explanations. That shows why the development of the widespread myths is so uniform.

If the mind rises too quickly to too great a height, it must, in default of all support, promptly fall — like Icarus. Without a doubt the myths were intended to idealize and to dramatize our premature imaginative syntheses; but, as a matter of fact, they unconsciously substituted for cosmic reality simple fictions of illogical activities. It was the tragedy of minds infatuated with dreams which had nothing to give them life except their own unreality. The same weakness made us abandon sensation, which is the mother of ideas, for the personification of words, which are merely the shadows of ideas — not real beings, as a misuse of language would have us believe, but rather, as a Greek said, 'statues of sound' — *nomina, numina* — as I have already reminded you.

Was it possible that this should be the last word of human knowledge? Only men of closed or sub-normal minds could resign themselves to such a fate. Thousands of years ago, in countries where the subtlest analysis existed, great minds did not fear to commit their own gods to the crucible of ripened intelligence, in order to draw from them even a slight knowledge of something superior to their divinity. Thus in India the day arrived when the creator, Brahma, became no more than an emanation of Brahman, the universal being in whom were united gods, men, the Cosmos, everything past, present, and future. Similar to Brahman is Atman, the spirit, the breath, the 'word' of Saint John; that is, the Eternal Unknown at whose side, not excluding Brahma himself, humble gods (of whom many are mortal) look like supernumeraries. Through that conception which led man to the most subtle metaphysics that he can attain — the Vedanta, with its intangible god;[1] the Sankya, in which

[1] To convince any one of the truth of that remark it is enough to quote from the Adwaita (monism) of Sankara the following propositions: 'There is only one existence, God. The world is unreal, or, if it exists, it is not distinct from God. God is impersonal. He is not conscious. He has no attributes. The human soul is identical with God himself.' Obviously there are plenty of interpretations to confuse whatever meaning may remain in each word. Shall I give

there is not even the undefined sort of god on which Spinoza leans. They represent observational knowledge combined with a complaisant pantheism. The question becomes merely one of formula. Then, as all quarrels ran their course, mystics fell asleep in the inexpressible 'word' of their dream, while minds devoted to experimental research strove to penetrate each day a little deeper into the intimate relations of things. Once the furrow is started, one must steadily drive the plough.

No doubt we shall continue to feel the general emotion that the Cosmos evokes in us, and that in some way must be satisfied. How paltry is that childish poetry in which the common herd obstinately expresses its commonplace ideal of humanity, halfway between dreaming and thinking, without ever trying overmuch to conform its life to such glimpses of beauty as it can obtain! In general, religions are put forward to fulfill the supreme function of helping the weak by founding a happy realm for 'the poor in spirit.' The proud intellect of Greece relied on philosophy to perfect its intelligence, and in greater measure than their masters its Roman pupils reached the loftiest regions of self-controlled action.

Virtuous words and deeds flow spontaneously from the strength inherent in the true elite, who are not much concerned with the religious doctrines that, according to the country and the age, are supposed to suggest them. Still, religion and lack of religion have none the less opened vast fields to the aspirations of that general sensibility within the limits of which superior humanity has evolved. Confucius, Lao Tsze, Moses, Socrates, Jesus of Nazareth, and Francis of Assisi are great by the same right and in the same way, but they do not excel Buddha, who at one supreme bound reached the summits of a philosophy of things in which man holds communion with all the emotions of the world and in

you an example? An excellent Roman Catholic missionary of Mysore, the Reverend J. F. Pessein, sends me a conscientious study of the Vedanta, which he undertakes to reconcile with Christianity, and I quote the following explanation: 'God is real because he alone is real. He is unreal because he is real.' And his book has the imprimatur of the Church! Obviously all texts could be reconciled through such methods.

universal charity towards all existence seeks the relief of common suffering.

DIFFUSION: MIGRATION

The thing to remember about symbols and their accompanying myths is their diffusion through all the lands of the earth from the Far East to the heart of the New World. It was all the easier for people to assimilate the inexplicable substance of those cosmic representations, since, through sensibility, which is the universal common property of receptive intelligences, they were all progressing from analogous mistakes to necessarily similar corrections.

The relatively recent discovery of the sacred books of India and of Persia, together with the known influence of those two countries on Greece, from which we derive, through the medium of ancient Rome, prove that we have been overhasty in considering the Indians as an imitative people. We are now asked to place in the first rank of our intellectual ancestors the countries of Chaldea and Egypt, which exhausted themselves by their own efforts. Three hundred years before Alexander, Persia conquered the valley of the Indus and the present province of the Punjab. How many prior invasions of the weak by the strong there must have been! Monuments and coins attest that northern India — a living force in comparison with the southern part of the immense peninsula — had not, as was generally supposed, yet opened the valleys of the Indus and of the Ganges to the Aryans of the Oxus. But even then the Euphrates and the Nile presented flourishing 'civilizations,' mothers of intellectual movements from which came the loftiest human formulæ.

It is now admitted that the Aryans were probably natives of the cultivated plains of the Danube Valley. We are told that they passed into Asia through the Bosphorus and through the valleys of the Tigris and of the Euphrates. One band of emigrants is supposed to have established itself in Iran, and another in the Punjab, 'the land of the five rivers,' that is, the valley of the Indus. Such is presumed to have

been the origin of the earliest invaders of India, whereas other branches of the Aryan people covered Europe with their offshoots, clearly distinct from the Semite and the Turco-Mongol. The kinship of the Indo-European idioms is beyond dispute. Comparative philology and the comparative study of religions and of folk-lore enable us to trace the development of a common mentality.

Were the Dravida of the Indus and of the Ganges, who, like the Dravida of the Deccan plateau, were swept back by the Aryan invaders, aborigines or earlier immigrants? The question is unimportant. The word 'aborigine' is nothing but an ignorant guess. Does it destroy the theory of a migration from the Pamir through the valley of the Oxus? We know nothing about it except that the high plateaux rather suggest emigration, whereas the richly cultivated plains make the scythe of the harvester reluctant to leave them. On the other hand, we can understand why the mountaineer should seek the fertile soil, but how, in his rocky country, could he have lived and multiplied in such numbers as to supply continual contingents of emigrants? On the other hand, we can explain how those contingents could have been formed on the plains of the Danube, but in that case what could have attracted them to unproductive land, and how were they led to migrate now toward the East, and now toward the West? Nothing is more obscure than these hypotheses of ethnic displacements predicated on risky deductions. However, the question affects only those migrations traces of which have remained to our day. All the rest are buried deep in impenetrable darkness.

Eminently receptive India welcomed everything, fused everything, absorbed everything. All the gods were its own because it had, perhaps, some vague consciousness of their common source in the springs of human sensibility and also often even of their affiliation and of their profound identity amid the overwhelming multitude of their names. Egypt, offering to Herodotus the parallels between divinities in which he delighted, seems to have had the same idea as to the common origin of the gods. But India assimilated every-

thing and never stopped. And an indefinite number of contradictions were thus reconciled — by philosophic question-marks at the frontiers of the unknown — in accord with the pantheistic inspiration of the Vedanta, of the Sankara, and especially of the atheistic Sankya, from which Buddhism and its continuation, Christianity, were derived, though both were promptly distorted.

The Grand Mogul Akbar, a conqueror conquered by his own conquest, wanted to fuse all the 'religions' — by which he meant nothing but the cults. Though he could not comprehend the fact, the syncretism of India, more all-embracing than his own, had in part already metaphysically realized the substance of his plan. Perhaps in the end he discovered that in religious matters the most difficult thing for man is to change his metaphors. I wish he had realized the fact.

Vainly the Bactrian colonists of Alexandria with all their might carved Hellenized Buddhas.[1] Buddhism was already on its decline. And since, reversing the order of the Romano-Christian revolution, it was the ancient Brahminic cult which, after a sleep of a thousand years, triumphed anew, India, not without a shock, found that the rites packed away in its storehouse of cultural accessories had an even greater effect on the reflexes of the crowd than did a purely philosophic 'religion' (?) which dispensed with a god, and which offered as heavenly recompense nothing except the hope of annihilation.

[1] The Hellenized Buddhist art of Gandhara is well known. Consult the remarkable work of A. Foucher, to whom we owe such masterly investigations. Bactrian colonists of Alexandria started Buddhist art while Hellenizing it. Until their time, reproducing the features of Buddha was forbidden. On the bas-reliefs of Sanchi he is represented by the sole of a foot, by a throne, by a parasol, by the tread of a stairway floating on the sea to indicate that he walked the waves. Every museum in India is full of those works of art in which Sakya Muni appears in Greek dress, or with the features of Apollo. As Buddha was a monk, he should have been painted with a shaven head. He generally has the flowing hair of the Greek, variously dressed, which obviously proves that this art is of foreign origin.

CHAPTER VIII

COSMOGONIES

REVELATION, SONG, POETRY, METAPHYSICS

THE CONFLICT BETWEEN FACT AND EXPLANATION

SINCE the word 'cosmogony' cannot correspond to objective reality at any point in time, it has no scientific significance. How can we talk of the origin, the genesis, of a world — whether we mean the earth or the Cosmos — that, as we have recognized, has, in spite of the account in the Bible, neither beginning nor end?

The theatrical nonsense of 'emanations' and 'creations' can have only the interest of tales of fiction suited to primitive mentalities. I should not even mention them, if the evil fate of man had not decreed that in spite of the progress of knowledge and of the intellectual growth that followed it, those fictions should even now aspire to impose themselves on every one as the supreme pronouncement of intangible, eternal truth.

From the remotest ages to the present, this is exactly where the tragedy of man and of his universe has reached its climax. Whatever the visions of primitive Asia, the interest of the great adventure lies less in the fantastic extravagances with which priests sought to dumfound the people than in the orderly progress of intellectual growth; and by going back to the start of that growth we can trace the original activities of the human mind.

Theological dogma has this peculiar convenience: since it is in itself the 'definitive solution' of cosmic problems, it has only to speak. As it is the 'possessor of supreme truth,' nothing that it has asserted can ever change. We receive 'revelation' once for all. The only effort our intelligence has to make is to accept it, open-mouthed. By so doing, man

'learns' all that he need ever know. The consequences follow even to the end of space and time.

To-day, every one knows that things are arranged in a quite different manner. Primitive man himself testifies to the fact, and his testimony is corroborated by the growth of his ever-striving intelligence. At first he grasped little more of the medley of things than did his anthropoid ancestor, struggling among the phenomena in which he was submerged. Habit dulled the acuteness of his wonder. But evolution required that he should always be sufficiently astonished to ask himself some sort of questions (for whatever they might be worth), and to follow them with some sort of answers. Those answers, which the nature of his organism determined, are precisely what we call 'revelation' — intuitive revelation that through talk became suggested revelation, or that through force imposed revelation. At bottom nothing could have been more natural, for question and answer necessarily sprang from the same human mental organism at different stages of its development.

It took a long time for those innumerable revelations (there were, in fact, as many as there were persons) to amalgamate, condense, and fuse into fragile bodies of doctrine, of which the imperfect tradition has come down to us with the tardy help of writing.

At that time the question of truth and error was meaningless. How could ignorance supply the elements of criticism? What form of argument could it produce? An affirmation without debate — such, actually, was 'revelation.'

But the day inevitably came when men of varying intellectual development wished to settle accounts, and when amid the tumult of human thoughts the everlasting battle of *Yes* and *No* began. Many were the centuries during which these revelations were at odds before they left the shapeless débris remaining after their great contests for credulous minds to gather piously and then to attempt to force them on us as the Holy of Holies of knowledge!

From then on, however, the scene changed. Science came into existence — science, less to be feared for its conclusions,

which were bound to be premature, than for the incoherence caused by the contradictions that it brought and that had to be reconciled. What does it matter that revelation, finding itself hard-pressed, proclaimed its own infallibility, if cold fact flatly contradicted it? What an innumerable number of failures and successes it will take to clear away the thick underbrush of man's earliest medley of sensations!

For a long time the theatrical wonders of a 'divine revelation' were preached at us — a divine revelation the poetic nature of which contrasts sharply with our hard-won and still uncertain knowledge, confused as it is with misconceptions. To-day, however, many persons begin to wonder whether the victorious issue of a battle, long in doubt and won by force of heroism against the resistance of the Cosmos, is not a finer thing than the easy privilege of a revealed knowledge that demands no effort of human will. How many ineffective ages had to pass before we could learn that there is no superior beauty in man except through the continuous organic evolution which it is his individual function to aid.

The Revelation that we are now told is unique and definitive, because it is absolute truth, is, as a matter of fact, preeminently multiple and transient. That is because every ethnic or family group strove to preserve its own revelation, exclusive of all others. And the situation had this special peculiarity: there could be no question of decisive proof at any moment, and, consequently, force alone could arbitrate. The poet, the family, and the tribe had each its particular revelation, and many of the revelations were fused through the accident of invasions or of wars in which the fate of gods was decided along with the fate of men. So true is it, that the revelation of each people, such as it has come down to us, is merely a heteroclite mixture of earlier revelations, that is, of traditions and legends distorted in ages in which no thread of positive observation could be consistently followed.

On the one hand, we have cosmogonies of dreams, evoked by the inferences of the imagination; on the other, scientific

cosmogonies obtained by retracing the course of activities recognized as related, that is, evolutions first inferred and later verified by our whole experience of cosmic action, knowledge of which we try to anticipate by bold hypotheses, maintaining the while our hold upon reality. Thus, as Laplace said, the odds are 'infinity to one' that some day we shall succeed in perfecting our sensations of things by scientific generalizations.

The common sense of the commonest people would be brought up short by many contradictions if when the results of research had been properly recorded, it still had to put faith in the clumsy misconceptions of so-called 'sacred' tradition. It is obvious that the words from on high which should form among men the universally accepted basis of knowledge have brought about only violent conflicts of irreconcilable opinion, whereas the modest conclusions of science have had the advantage of uniting all minds in the common acceptance of determined facts.

The partisans of intuition throw in our teeth the imperfection of our knowledge. We cannot alter the limitations of the human mind, to which, however, the credit of having set up systems of scientific knowledge amid the wreck of divine 'revelations' cannot be denied. The unknown leaves us no choice except either to accept ignorance or to win step by step a fragmentary knowledge that according to the period permits us by its tentative affirmations to form a doctrine of the 'known.' Is this tantamount to saying that we ought to prefer to such knowledge the dangers of presumptuous affirmations which, far from ever attaining that degree of 'certainty' in which the theoretical margin of error may provisionally be disregarded, continue daily to deteriorate and crumble away? Everything in the world and in ourselves is eternally renewing itself; that is the law. Who can complain? If Einstein has actually corrected Newton, surely no one would have been better pleased than Newton himself; it certainly would not have occurred to Newton to denounce Einstein to the Holy Office — as Galileo was denounced. Moreover, the day will inevitably

come when some one will correct Einstein. Fortunate indeed is man whose lot it is always to increase his knowledge!

PRIMITIVE COSMOGONIES

There is no field so favorable for flights of imagination as that afforded by cosmogonical tenets. 'Revelation' sticks at nothing. Scientific hypothesis, on the contrary, must not only strive to account for phenomena; it must also accord to a satisfactory degree with the general truths of acquired knowledge. That is why we had to wait so long for Kant and Laplace to try to substitute their own hypotheses of a positive cosmogony for the intuitive affirmations of primitive ages.[1] Whatever may hereafter happen to those great views, parts of which our later investigations tend to confirm, they will preserve the eminent merit of having extended to the very doorstep of the elements the scientific explanation of the cosmic phenomena that force themselves on our observation.

It was not so much men of science, who in those ages were not in a position to know, as poets, always ready to sing, who were needed to declare the magnificence of the first cosmogonies. The rhythm of poetry with the cadence of its sonorous words seemed in those days to be more authoritative than the experimental analysis of which at that time no one even had a notion. Forestalling all knowledge, primitive poetry and metaphysics[2] together climbed toward the brightest summits and never ceased creating fictions of supreme divinities.

Since all myths enjoy the same rights at the tribunal of the imagination, nothing is more natural than that different cosmogonies should have simultaneously held the attention of the same people. Such was bound to be the case everywhere until a general agreement could be established, based on the workings of our emotional nature and com-

[1] The term 'positive cosmogony' should be taken here to mean, not a genesis, but the origin of the form of our solar world, together with everything that followed it.

[2] As a matter of fact, metaphysics is a kind of poetry; its only crime is that it demands to be considered as a fact.

patible with the appearances of things with which man had to be content. What did it matter if the themes of cosmogonies became entangled? Subject to the accidents of invasion, of migration, and of every mixture of races, the progress of the human mind was sure to decide the ultimate fate of men and of gods.

As I have already remarked, as soon as man found himself able to coördinate his rudimentary ideas in interrogations — though the interrogations were so vague that neither the questions nor the replies could have any suggestion of modern exactness — the first crude outline of a cosmogony was drawn. It took man a very long time to progress from particular to general ideas, couched as vaguely as could be in a language rooted in sensation — a language that, though fitted to become a marvelous instrument of progress, was destined to hold him for long ages in the stupor called forth by his first sight of the superficial appearance of the world.[1]

Incoherent ignorance, in its clumsy attempts at eventual coördination, found as many fields as there were human groups. It is impossible to compute the time that must have elapsed before the appearance of the first propounders of revelation, for their existence indicates at least the outline of a question framed with approximate correctness. But the day was still far distant when without assuming too much, prosaic knowledge could depend for a solution of the problems of the universe on fragments of ancient poetry.

Let us leave those days of atavistic darkness to the silence of the ages and enter upon that Eden of primitive legends in which the poet plays the part of the man of science. In comparison with the length of the periods of which we know nothing except that they consisted of centuries heaped on centuries, our Biblical Genesis is of yesterday,

[1] The reader should remember that 'superficial appearance' varies with the degree of evolution reached. In the case of the contemporary Fuegian the appearance of any object is conditioned quite differently than it is in the case of the most backward schoolboy.

and Moses is essentially like a grandfather telling stories to his grandchildren. To judge what Moses knew of man and of the world, must we not first try to understand how the problems that he put within reach of the ignorant framed themselves in his own mind? Indeed, it would not surprise me if he did not question himself very profoundly. He was a legislator, that is, a conceited man whose weakness struggles against ignorant impulses to which he yields while believing that he guides them.

While our ancestors painfully groped their way among the blind mazes of the first cosmogonies where myths and metaphysics quarreled for the credit of making mistakes which they regarded as achievements of knowledge, the work of nascent observation had begun and could not be dodged. One man saw the earth as flat, surrounded by the ocean stream; another saw the blue vault as solid, but pierced with holes for the passage of fire, the movements of which he interpreted as chance and an imagination not yet restricted by scientific observation might determine. The Indian of the great poem, when he had dug deep enough, was not surprised to find that elephants supported the world. Hypothesis and knowledge danced to the same tune. Man thought, man lived, in affirmations founded on chance.

That was the general practice since there was no other choice. However, in spite of all our misinterpretations, the first systematic scientific observations, at once presumptuous and timid, reached a point where they vaguely defined the field. There resulted a loose mass compounded of truths and errors, from which as if from a matrix man was to disengage bits of approximate truth which the law of his life decreed he should relentlessly apply himself to testing experimentally. Thus it happened that the Chaldeans, to whom the glory of having founded astronomy is due, also invented the nonsense of astrology and clung to it so tenaciously that it took many centuries to disentangle the fictions of Babylon and Nineveh from our laboriously woven fabric of objective fact.

That phase of evolutionary action is perfectly natural.

From the first our relative knowledge, lacking any criterion, started with an improvised affirmation, and then by eliminating the factor of error went on toward the actual relations of things. From that point of view we have tried the history of every branch of our knowledge — and not without success [1] — as a means of approaching evolutionary knowledge, which, though less prompt to arrive than dogma, is more stable.

In the history of our mental acquisitions we may properly be disconcerted by the fact that although human understanding was bound to yield sooner or later to every procedure of scientific observation, the synthesis so cruelly shocked the facile emotions of the ignorant, upheld by social interests, that wars of dogma, massacres and the fires of martyrdom were necessary before the earth was allowed even to turn. The fact seems to astonish no one, and, indeed, a thousand reasons are given why it is deemed unbecoming for people to speak of it. I am sorry that I cannot go more deeply into this part of our intellectual progress, at once so glorious and so insanely barbarous, in which we see the greatest names in science rise into view amid the most savage persecutions, merely because their owners wished to enjoy the inherent right of every man to use his own reason.

The first general agreement reached by incipient human society could not be based on anything except general imaginative notions, vaguely supported by the rudimentary metaphysics of a world-order controlled by the caprices of the gods. And the farther the prophet kept from dangerous reality, the more ardent, the more intolerant, became the crowd, easily stirred at the spectacle of a world where every phenomenon was a miracle, that is, inexplicable. In the absence of all methodical mental discipline a few inspired dreamers demanded fictions conforming to their dreams and fairyland adventures rather than approximate knowledge. Men begin by dreaming and later, when they have learned how, they think.

[1] I refer those curious about these matters to the conscientious work of Sageret, entitled *Le Système des mondes.*

In the period of the first ideas, the common stock of sensation and of imaginative explanation had to be harmonious throughout, if it were to expand into a spontaneous development of eager faith in the seer whose advent was imminent. A group of men communicated, and still communicate, more willingly in the facile terms of fiction than in those of laborious experiments difficult to explain.

Furthermore, it was less a question of conviction (in our sense of the word) based on a union of experience and reason than of casual support or of weak surrender, for to contradict, or simply to doubt, entailed a vexatious loss of prestige in the eyes of the crowd, powerful through its clamorous affirmations.

Here is an even better example: a purely formal adhesion was superfluous in the case of the cosmogonies. When some one amuses us by singing, 'It ain't goin' to rain no more . . .' we are not expected actually to believe that it has rained hard and long. Every one keeps on repeating it, and that is all that is needed. The first legends were probably chanted before they deteriorated into the prose with which science is content, and rhythm and pitch gave them a far more decisive power of conviction than any which they derived from their substance, which passed haphazard from mouth to mouth without ever exhausting the patience of those who did not understand it. The fact is that all people wanted was a pleasurable emotion. Every one stepped forward with his poem, good or bad, and the man who sang the loudest was the most successful. So many traces of that ancient state of mind, so like our own, have survived, that no other proofs of the slowness of the progress of the human understanding are needed.

Because in the beginning no real 'conviction' (in the modern sense of the word) was insisted upon, the flood of chants kept on spreading abroad a superabundance of tales and of rudimentary myths that, far from competing, adapted themselves to one another, penetrated one another, and thus renewed their vitality. In those days, in the absence of all critical demarcation between truth and error, everything

was good; everything was 'true'; everything was at least acceptable. At a time when to convince, one need only sing,[1] it was a sign of weakness to remain silent.

It is generally admitted that the most beautiful hymns of the Scriptures are among the most ancient of compositions. The same holds true of the hymns of the Veda.[2] Nothing could be more natural, since among the oldest historic races, interpretation of the world began in songs at a period when human emotion was most fervid. The name of the Vedic Brahman, which means universal god, and which has also been translated 'prayer,' likewise means hymn, the poetic form of invocation. The authorities on the subject have clearly brought out that the hymn itself is a magic procedure primitively intended, according to the true doctrine of sacrifice, to coerce the will of god.

Song requires a poetic subject; otherwise it is a mere vocal exercise. The hymn is a form of religious activity and as such implies a purpose, which in this case is a pressing necessity, since it involves nothing less than controlling divinity for human ends by means of an incantation. At the same time that fact clearly indicates what the original relations were between man and his god. After trembling before his phantom god, man inevitably tried to conquer him, to dominate his ominous master, whom his fear painted as formidable, but whom we now regard as the power of supreme benevolence.

If we have some trouble in mentally reconstituting those far-off periods of primitive mentality or if we can imagine them only as a medley too confused to be classified, we shall gather only some obscure fragments of a history extending over a vast expanse of time and space, greater by hundreds of thousands of years than we can conceive.

[1] It is well known that etymology identifies the idea of poetry with the idea of creation. Nothing could be more legitimate. Prose requires a definite thesis which can be argued. To be successful a poet needs for his song merely an emotional mood, ready to accept magnificent fancies as real, of which he is both the inventor and the creator.

[2] The Vedic hymns illustrate the stage of civilization perhaps attained in the year 2000 or 3000 B.C.

Might the vague questionings of primitive ages have obtained replies definite enough to enable us to classify the interpretations? No. The formulæ that have survived are the accumulated result of ages and lend themselves with difficulty to any succession of coördinated analyses. To speak of the cosmogony of any people is simply to summarize a prolonged course of fluctuating visions that, as the accidents of poetic amalgamation determined, became established in what to-day we call 'creeds.'

Indeed, all the peoples of the earth have lived one after another on indeterminate legends that in the course of ages have been superimposed and intermingled. Never bothering themselves about incongruities or even about violent contradictions, they have promiscuously lent and borrowed myths and poems. No one tried to bring order into the confusion, for it was the empirical element in imaginative knowledge that penetrated the least deeply. The fictions were never in danger; their memory was bound always and universally to be piously preserved. Even the improvisations of elementary metaphysics, endowing myths with an element of logic, inflamed minds prone to accept unverifiable affirmations and were transmitted from century to century as the most precious treasure of future generations.

Thus, quite of themselves, fables became 'sacred,' except in so far as they were later to be subjected to inevitable criticism. Their characters, regarded as real, were manipulated to suit a superhuman dream — a response of the imagination to questions that the intellectuality of the time, though about to have a presentiment of them, was inadequate to attack. Based on fluctuating themes, the unconscious metaphysics of the poem was consolidated into a doctrine of intuitive knowledge by builders of systems who did not suspect what it means to know, or even what it means simply to examine.

The result was that by dint of reaching out in every direction in which realized abstraction could entice the human mind, the flashes of insight that came to the inquisitive

ignorance of remote ages were able — oh, prodigy — actually to anticipate the finest inspirations of metaphysics on which our academies now bestow prizes. In India, the wholly, or almost wholly, deistic Vedanta, and the pantheistic Sankya outdistanced by a whole age the Platonic subtleties of the school of Alexandria — a very sharp lesson, by which, however, the metaphysical élite did not profit. There can be no regularly continued mental progress not based on verified observation.

Any one who has the curiosity to consult the works dealing with the cosmogonies of Babylon, Vedism, Buddhism, Celts, Teutons, Chinese, Semites, Egyptians, Greeks, Hebrews, Persia, Japan, America, Christians, Islam, Polynesia, etc., will be appalled at the dense jungle of gorgeous puerilities which so long confused peoples who to-day aspire to be considered civilized.

It is impossible for us to reckon the periods of time in the interminable course of which evolution slowly and obscurely dragged itself along. Our written 'revelations' necessarily represented only the ages prior to history and accomplished nothing beyond developing unsystematic inquiry into hasty formulæ that had to wait centuries for the tardy application of rigorous tests. How many thousands of years it took before the stupor of awakening man asked the first excited questions big with splendid wonder!

Amid universal confusion the first battles of the human mind were fought against the night of the unknown — a night as dark as that other night in which Ajax struggled, furious that his blows fell on empty air. Homer's hero at least had the sensation of violent effort wasted. The misfortune and the blessing of our remote ancestors was that they were so slow in appreciating the differences (even now obscure) between appearances and the things that we to-day can hold as realities. How could any one *know* at a time when both eager question and primitive reply sprang spontaneously from the same mental weakness, obviously indicating that there was no sure comprehension of either? To accomplish the extraordinary mental progress in which

we take legitimate pride, it was necessary to advance slowly through an organic preparation, the natural action of which was long ineffective, badly differentiated, confused and misleading.

To the fantastic affabulation of the cosmogonies, of which the fallacies are not yet exhausted, were fatally joined concerted mental procedures that condemned us to run the chance of error before we could attain our provisional truth. There existed a procedure of 'revelation,' a procedure of myths, a procedure of metaphysics, all risen from the inmost recesses of our rudimentary intellect, long before it was conscious of any encounter with reality. The capital mistake was to believe that the capacity to ask questions brought with it the immediate capacity to answer them. Only centuries could teach us to frame the problem of the world in terms that were the condition of its eventual solution.

Mental evolution irresistibly followed its course, and the day on which we were able to rise to the point of formulating the problem of the world — using formulæ from which all classifications of relativity were to flow — is a decisive date in our history. As compared with those formulæ, what value have the cosmogonical revelations of Moses, long recognized to be of Babylonian origin? For our scientific structure they have the same historical value as have all other ancient legends of which the roots are sunk in primitive night. Let us pay to them a pious respect in recognition of their natural inadequacy; and let us then pass on to the observatory.

PROGRESSIVE CONSCIOUSNESS OF THE PROBLEM

Whatever the origin of the universe and whatever its destination, it holds us in its power and is carrying us to developments the infinite succession of which is beyond the grasp of our experimental science. Therein lies the whole measureless field of the future. We, who are here to-day and gone tomorrow, have saved from the unconscious dominion of material things some possibilities of knowing and of acting

which assure us the advantage of a slight collaboration in the task of the planet, wherein the unconscious and the conscious are provisionally merged. However, the Cosmos remains our master, even in the interlude of a life that fascinates us with the expectation of an ephemeral requital for the inevitable victory of infinity.

It is the flash of this explosion of personality which so excites us. Our excuse lies in the fact that it is our high privilege to be conscious of ourselves and of things, and that we can thus tremblingly raise ourselves to summits from which in the turmoil of our brief life we can question the universe with a view to adapting it to our own purposes. That aspect of life does not create conditions especially suited to the disinterested meditations of philosophy. We must come to them, nevertheless, for it is our fate to attempt ever loftier generalizations, just as Hindu metaphysics did not fear to go beyond its god.

The need of anticipating scientific knowledge before we had had time to observe is what threw us into the dreadful complexities of the enigmas of cosmogony at a time when we were ignorant of the first elements of the problem. Whether more or less insistent, our sensations of the world, corresponding as they do to the first shocks to our Ego, are as spontaneous an organic reaction as sneezing. The Ego everywhere insinuates itself into the cosmogony. Whether for good or for evil, its sole concern is to make the world objective for its benefit. Scarcely more than an animal, the man of Chapelle-aux-Saints (and even more Pithecanthropus, specimen of rudimentary man) could not foresee the evolution that was to carry his descendants to the highest destinies. Thinking man was awaiting his cue to enter upon the scene.

When understanding confronted the cosmic screen, how was it to resist appearances until it had a foundation of science? The bare fact that the question had arisen proclaimed a mental advance much beyond anything that the most intense effort of animal thought had accomplished. To consolidate his advantage, man presumptuously claimed

that the stages of intellectual awakening — sensation, consciousness, imagination, thought — were his exclusive prerogatives. Descartes, adopting the principle that the world must undergo scientific examination, although he disastrously limited the scope of its application, nevertheless stood on the brink of the finest of mental revolutions; but he dared go no farther. Hence came that incongruous conception of animals as machines, on which the 'great century' in its pompous perukes gravely debated.[1]

Man only needed to open his eyes to see that sensation is the primary attribute of animated life, and that at every stage of organic progress the consciousness that sets off the Ego from its surroundings, as well as the incipient indications of imagination and of thought, can differ only in degree throughout the organic scale. Our present ideas about the action of the nerve cells do not as yet permit us to enter into the intimate developments of the successive sensations that constitute continuity of consciousness. If we succeed in establishing comparative psychology on a scientific basis, we shall have free access to the first stirrings of mental evolution.[2] We shall see that youthful courage has tried its hand at the task, not wholly without success.

[1] La Bruyère was 'mechanistic' as a matter of doctrine, and there were many more.

[2] I like the term 'comparative psychology,' because it indicates not only the method but the purpose of studying the dynamics of our receptive processes. Having, like the word biology, its origin in metaphysics, the word psychology seems to imply an independent economy of organic activities, wholly isolated by the seeming strictness of our subjective classifications. Until the experimental method was adopted, our psychology could be nothing but metaphysics. When the theory of evolution appeared, the interconnection of the reactions of our senses brought out such relations among our organic activities that the necessity for a new doctrine immediately impressed itself on the budding ambition of science. It is that necessity which I try to emphasize in speaking of a comparative psychology that, calling for the observation of organic action in the evolution of heredity, rids us of metaphysical tautologies, and in so doing installs the study of mental dynamics in the general field of biology.

As we shall see farther on, the school of Jacques Loeb has opened a magnificent path in that direction. Germany, America, and France have distinguished themselves by important contributions. I should especially note a remarkable publication by Georges Dumas, who collaborated with twenty-five of the best

Man's first progress beyond the mental status of the animal was doubtless very slow until the curtain that hid from his dim eyes the path to the most elementary analysis of the exterior world was torn away. Then appeared the purely human phenomenon of an inquiry into causation; that is, an attempt to determine the antecedent phenomenon before it passes into the consequent phenomenon. At first, such determination was of course rather the result of chance than of that methodical research which was to be practiced not until much later.

As soon as man began vaguely to recognize the connection among things, our groping thought was offered a new field of endeavor. The simple idea of a universe intended for the use of humanity; the idea of a Cosmos restricted to the earth and to its stars, *with man at its central point*, was naturally bound to suggest itself as justifying through a thesis of great imaginative plausibility the immensity of the unknown. As a result, the aggregate of illusions, spontaneously formed into a body of 'explanatory' metaphysics, stood ready to supply stammering responses before the questions could be scientifically formulated.

The responses were necessarily incorrect, because the questions, being chaotic, could have neither the precision nor the coördination of scientific ideas. The responses were naturally of the same quality as the questions, even though immeasurable progress had been made by merely interrogating things, since that very interrogation implied the beginnings of connected thought. To sum up; man, 'the center of the universe,' expected to see himself put into possession of *his* planet, made for *his* use by no one knew what Workman, whose principal occupation was to be to disentangle himself by means of human intelligence from the snarl that for no known reason he himself had created. Adam proudly names all the animals of which he constitutes himself the owner, but trembles and hides when he hears

qualified students in writing his *Traité de psychologie*, the object of which was to outline in general terms, but without losing connecting links, the course that should be followed in the laborious construction of the new science.

'a voice in the garden.' Was not his the strength and the weakness of the child?

If it was a noteworthy advance in mental progress for man to arrive at asking himself what was the origin and the cause of the world and consequently of the human race, there were too many elements of the problem that inclined him to yield to the seductions of imagination for him to be able to keep his hasty solution from being anything but a pure misconception. While he awaited the attempts at analysis and synthesis that required ages of attentive observation to gain strength, it could not, indeed, be otherwise.[1] As yet there was no trace of any scientific data that might have checked the imagination and kept it within bounds. It was purely a case of the understanding's being thrown out of its orbit by the shock of two misconceptions based on contradictory procedures. Of those procedures one was without any foundation in coördinated experience and even flatly contradicted everything that subsequent mental effort put us in position to know, and the other tried to raise a general structure of relationships within the limitations of relative observation. Though we must not give up the idea of seeing the two procedures (we cannot yet speak of them as methods) pulling at the same empirical yoke, it is important for us to recognize the divergence between them.

Through heredity the original activities of our intelligence became too deeply implanted in our incipient cerebration for our reflexes easily to throw off at a later date the forms of action that had trained and strengthened them. To be able to deceive ourselves was, as I have said, a step in advance. A false step was inevitable, for our original conceptions were necessarily theories that could not be tested, and that had to remain untested, until such time as we had learned to observe, to coördinate, and to think.

[1] The metaphysical idea of a cause fictitiously detached from the universal chain of things was the first effort of spontaneous misconception. It is unfortunate that a sort of mental contraction still prevents so many thinkers from advancing beyond it.

It is always surprising that experimental progress should have had so little effect on the dreams of ancient times. But one must consider the momentary power of agglomerate atavistic weakness sustained by irresistible social organizations of either obvious or concealed interests. A fundamental misconception of things thus became rooted in the heart of new-born societies through a body of commonplaces that were easily understood by men of rudimentary intelligence, and that through the action of heredity, aided more or less discreetly by interested selfishness, were preserved in their reflexes. Is not that exactly what our Christian societies proved when, though paying lip-service to universal charity, they carried the resistance to scientific knowledge to the point of the bloodshed that their doctrines sanctioned?

MOVEMENTS OF PEOPLES: MOVEMENTS OF THOUGHT

I shall have to content myself with a few brief remarks on the most familiar cosmogonies: those of Chaldea, Egypt, India, Hellas, and Israel. Of the transmission of those first treasures of rudimentary interpretation we know nothing. Migration, dubious traces of which have in some cases come down to us, doubtless played a determining part. The winds have carried away the last vestiges of that ancient dust of humanity that was trying to think.

What roads were open between the undetermined continents from which the first Aryans emerged and the passes that gave them access to the valleys and plains of Asia and of Europe, is something that we shall probably never know. No hint of the community life of that primitive people survives, except the implements of flint and the megalithic monuments found over such wide areas which seem to indicate that the indeterminate race which had spread all over the world had attained a uniform state of development. The different traditions did not appear until after the settlements that resulted from the migrations of Indo-European tribes across Persia, through the valleys of the Indus and of the Ganges, as far as the mountains of Burma, and that, on

the other hand, were distributed in Europe under conditions unknown to us.

Some scholars, relying on the analogies that exist between the monkeys of the Malay Peninsula and those of continental Africa, maintain that the land in which primitive man became differentiated from the anthropoid is now submerged. Such a continent might have existed in the Indian Ocean. What can we say about the first forming of human herds and of their chance wanderings? Because of the care that human offspring require, as well as because of the temporary influence of sexual attraction, the child, as I have already pointed out, created the family before fire created the hearth. On the evolution of the family group we have a groundwork of historical inductions. Every one knows what excellent use Fustel de Coulanges has made of them.[1] How long the purely animal family existed among primitive humanity is impossible to calculate or even to guess at. We can vaguely grasp some uncertain traditions of the complex hypothetical itineraries in the course of which, as a result of systematizing defense or offense, the tribe, the city, and the embryonic state were formed. The conflicts among all groups, added to the hostility among races firmly established in their customs, brought about the development of an authority charged with giving effect to a despotic justice — a form of coördinate violence that mitigated abuses with words which seem to contain vague gleams of idealism.

The scholarly hypotheses of philology tell us of the adventure of human migration. In all things genius can err (Descartes and Cuvier have shown us that) as well as dazzle us. The comparative study of the development of language has given us very precious hints. I cannot touch on them here.

In his conscientious 'Histoire de l'Asie,' René Grousset's opening remarks on the origin of Indo-Europeans omit all mention of the migrations from the Pamir in order to bring into relief 'the Baltic cradles (Lithuania and Poland) of the peoples who speak European tongues.' Another hy-

[1] *La Cité antique.*

pothesis substitutes for the Baltic region, as the place of origin of the Indo-Europeans, the plains of southern Russia, north of the Black Sea, on the banks of the Dneiper between the Danube and the Volga. From that region the eastern vanguard of Indo-Europeans is supposed to have gone to Asia in two groups; the Indo-Iranians by way of the Don, the lower Volga and the Caucasus, and the Hittites, like the Indo-Iranian worshipers of Mithras and Varuna, whose names appear in the inscriptions of Boghaz Keui, by way of Thrace and the Bosphorus. The rest of the Indo-European tribes are supposed to have traveled across the plain of Hungary toward southern and western Europe; the Greeks toward the Balkans, the Italiotes toward the Apennines, the Celts toward Germany and Gaul.[1] Over-precision in such matters exposes one to grave errors.

This ingenious thesis, which is supported by some positive knowledge, is provisionally accepted by many. It seems, for example, clearly established that the so-called Indo-European migrations, instead of happening in semi-fabulous times, are of relatively recent date, perhaps from fifteen hundred to two thousand years before our era. Could the civilization of our day be developed in so short a period? As to the migrations that preceded the Indo-European, what can we know of them? All that shifting of populations, the deep underlying causes of which we do not know, must necessarily have been related in some indeterminate way.

To sum up: it is possible that after the Egyptian Middle Empire came to an end, a part of the Indo-European races (the blond, Nordic race of the anthropologists), speaking an Aryan tongue, left the Baltic region and descended to the plains of the Black Sea. That the Indians and the Balts had a common origin seems proved by the remarkable affinities that exist between modern Lithuanian and Sanscrit. The remaining groups, which came from no one knows where, are supposed to have continued their advance. But that advance may have been interrupted by stops that lasted for centuries. One such stop may have occurred in southern

[1] Cf. Albert Comoy: *Les Indo-Europeans*. Brussels, 1921.

Russia; another in the Punjab, which the migrants entered through the valley of Kabul. There, while the Dravidian peoples gradually retired and settled into that passive resistance which preserved them, the Indian people, properly so-called, marking the succession of the Vedic ages, came into existence before it passed from the valley of the Indus into that of the Ganges. This is pretty much all we can now say of that famous 'Cradle of the Aryans,' of which the Achæmenidian legends speak. Let us hope that some day new information will make our knowledge more definite. We shall then, perhaps, gain some light on those Balts, credited with being such a powerful influence over the future. How did they happen to be in that country? What events had led them to it? Science and imagination will always be equally persistent in their desire to retrace the course of the centuries.

A dark abyss remains between the herds of primitive men and the ethnic groups which later became agents of civilization. After the formation of the principal groups whose memory is doubtfully preserved, even the thread of their subsequent affiliations often escapes us. Is it not very surprising to discover the same legends and the same descriptions in the great poems of Hellenism and of India? The Ramayana narrates the war of the Giants, of the Titans, and of monsters with a hundred arms against the gods who emanated from Brahman and tells how they were aided by monkey-magicians whose chief, Hanuman, accomplished such exploits that he has remained one of the divinities of the Hindu pantheon. The poem would be more suggestive of some connection with the theogony of Hesiod, if time and time again the persons and scenes of the drama did not directly evoke memories of the Iliad. The Greeks, by way of maintaining that their glory was wholly their own, said that some one had 'translated Homer into the Indian tongue.' Is that not another proof of the resemblance between the two works?

Furthermore, Hellenism is not alone in finding the source of its revelations in India. Christianity should in its own

defense recognize that the idea of an incarnation of the divinity came to it from India, where, together with the trinity (Trimurti), it forms a part of accepted literature. Rama, who is an incarnation of Vishnu, acting as a redeemer, again proves that Christian dogma was inspired by ancient traditions.[1]

There can be no question here of starting a philosophic debate concerning the cosmogonies, which, inherently unscientific, are primarily poetic effusions. The Vedas united the highest beauty of creative poetry with the spontaneous outpouring of the loftiest philosophy.

In ancient times, as I have explained, there arose poets, to whom men eagerly listened, and who offered to the artless crowds marvelous ancestral legends, the romantic nature of which caused universal enthusiasm. It was generally agreed that the world found its excuse for existence in man under the dominion of superhuman personalities who were, and could be, but the freakish representations of an exaggerated humanity. In the vast domain thus afforded every fancy was free to take its course. And not one of them missed the opportunity!

Those imaginary cosmogonies—poems blended as a haphazard syncretism chanced to dictate [2] — could have no

[1] Needless to say, the authorities of the Church do not admit the pagan source of Christian dogma. Since they cannot reverse the flow of time, they content themselves with telling us summarily that the analogies between the Hindu and the Christian trinity are the result of 'presentiments,' with which the Divinity favored — no one knows why — the worshipers of 'false gods,' though, with or without that semi-revelation, those worshipers were destined to the eternal fires. Why the divinity should have adopted the course of making imperfect confidences that could have no possible result, they neglect to tell us — and for good reasons. Trinity, incarnation, redemption — all of them authentic dogmas — were 'revealed' to us in contradiction to the march of the ages — the later phenomenon, contrary to the laws of causation, becoming the source of the earlier phenomenon. For your edification, read the *Histoire des religions*, by l'Abbé de Broglie.

[2] We can clearly see the effect of that syncretism in the Biblical Genesis, in which the God of Moses made two bites of the creation of man and woman such as they are to-day. The encouragement that Jahveh gave himself when he declared that his work was 'good' did not keep him from changing it soon afterwards by way of trying, though without success, to make it better. Here are two legends that do not fit together. And what stronger proof could there be

weight except that of a fiction, convincing rather by its emotional quality than by the imprecise significance of its terms, which were based on mingled ignorance and misconception. I have said that song, that is, the simple emission of the voice, more passionate than articulate speech, must have preceded language as an expression of emotions that had not yet developed into ideas. Has not purely musical interpretation kept the great charm of completely harmonizing with our emotions — a charm far beyond the reach of the dry formulae of articulate language?

Poetry — rhythm of articulate speech — with all its train of accents, cadences, and metaphors, of which the eminent merit is that they keep all precise ideas at a distance, later mingled the notes of measured words with the sonorities of numbers. That was the age of the bards, reciters and singers, who were free to make improvisations that on any fit occasion could be slipped into the text to suit the taste of the listeners.

On the other hand, parts of the legends, deformed by inaccurate transmission, were often lost. As to attributing authorship, it was a considerable accomplishment at that time to have grouped divers works under the name of one person, who sometimes attained that exceptional glory without having taken the trouble even to exist. We know no more of Homer than we know of Orpheus, even if we accept the tradition left us by Onomacritus, who at the order of Pisistratus collected the works of Homer, and who transmitted to us the hypothetical attribution to him of the little poem that mentions the 'old blind man' of Chios.[1] Hesiod offers us more in the way of fact.

At that time, humanity, content with emotion, hardly stopped to consider what were the conditions of knowledge.

of his anthropomorphic character than the 'fatigue' necessitating that rest on God's part which, though totally inconsistent with the notion of the tireless energy of the Divinity, we celebrate — for our own benefit — every Sunday?

[1] Modern criticism does not admit that the Iliad, the Odyssey, and the other poems ordinarily attributed to Homer, some of which are masterpieces, can be placed to the credit of any single bard. The remark applies even to the hymns of the two great poems.

It had no other way of learning than by listening to those who had anything to say. And every one had something to say who was capable of imagining, that is, of creating out of his own heart and brain pictures for which the world, unintelligently questioned, could, by way of explanation, supply him only with appearances. That does not prevent considerable elements of observation from existing in Homer.[1]

Orphism, with its fragments, whether authentic or not, answers nothing of our questions beyond what Homer has already answered. Hesiod, on the other hand, vividly realized the changing aspect of the poem of humanity as he conceived it.

The cosmogony of the poet of Ascra is, as he himself has declared, a theogony, that is, an ordered creation of divine Powers begotten among themselves in the likeness of human beings.

For Hesiod and Homer, with their invocations to the Muses, the Cosmos belongs to poetry; for Manu, it is the field of metaphysics and the basis of social authority; for Moses

[1] As, for example, those captives of Achilles who, when ordered to weep for Patroclus, wept indeed, but for their own misfortunes.

Since I write so much of Homer, I should like to tell an anecdote that shows the incredible precision of observation in those days. If I am to do so successfully, I must step in person upon the stage:

In my youth I took much pleasure in a Vendéen manor of the sixteenth century. It had a court of honor, around which were grouped what remained of a chapel and of a falcon house as old as the ruined keep. The door of the chapel, and the door of the bird-house, which were of solid oak and heavy, fairly shrieked on what was left of their rusty hinges, each with its own peculiar lament. Indeed, so distinctive were the two sounds that after nightfall you could tell through which of them any intruder was coming. We were quite familiar with the squeak of the two hinges, both of which ended in a harsh, shrill wail.

One evening, after a day spent hunting with my brother in Normandy, we were suddenly surprised by a metallic, grinding noise far behind us, like a discord from some enormous horn. And, vividly impressed with the similarity of the sound, we exclaimed both together, 'The door of the bird-house!' Returning immediately, we saw a tethered cow, whose keeper was late, lowing to be taken to her stall.

Then I remembered that, when Penelope went to seek the bow of Ulysses for the trial of the suitors, the wings of the door, which, the bard tells us, had not been opened for ten years, gave forth a wailing sound like that of a powerful bull. I was amazed.

it is an opportunity for deductive logic. Therefore, the argument of the drama was bound to arrange the scenes according to differently conceived plans. Imagination was always to supply the plot of the poem, and the personification of words was either to grow subtle amid labyrinths of metaphysical entities, or to be lost in the ice of a mathematical philosophy that under the guidance of Spinoza was to express human life in equations.

Like Lucretius, precursor of the theory of scientific observation, Hesiod and Homer were singers. Manu, Zoroaster, and Moses were poets whose imagination grew hard and stiff in the rigid formulæ of the legislator. In 'The Works and the Days,' Hesiod more or less vaguely tried to find a relation between his empirical counsels (without foundation in dogma) and the kind of human conduct logically to be deduced from his theogony. What he says proves that sometimes he saw better than he dreamed.

As to the story proper of the cosmogonies, its puerility is so flagrant that we should be abashed by it, were it not for tradition which sinks its roots to the very depths of our mentality. Should any one to-day offer us the unadorned fables contained in the sacred books of any country as something new, no one would do more than shrug his shoulders. But a man who from infancy has heard them repeated over and over again, with the appropriate amplifications, too often responds to them even in maturity by an automatic assent of his mental reflexes that precludes all scrutiny. And later, when that man might be tempted to look beyond fable, we shall find that he is so used to taking the everywhere current word 'intangible' as expressing a thought that he has become merely a mental automaton.

I retain a lively recollection of the kind of faith that I had in the tales of my earliest years. I saw the characters live, and the idea of any distinction between their fictitious existence and living reality did not even occur to my mind. 'Peau d'Âne' or 'Riche-en-Cantile' seemed to me to occupy the same plane of existence as Louis Philippe. Probably we should astonish many regular customers of the cir-

culating libraries were we to tell them that the 'Three Musketeers,' who have become almost historic, never existed.

We can see the cave of Zeus in Crete; the rocky shelter at Delos (of human contrivance) [1] where Latona gave birth to Artemis and to Apollo; the three-forked road where Œdipus killed his father; the Mycenæ of Agamemnon; the Tirynthus of Hercules; the palaces at Gnossos and at Phæstos; the cave of the Cumæan Sibyl; the Hyampean rock at Delphi, whence Æsop was thrown down; the Sinai of Moses; the Mount Ararat of Noah; the grotto at Bethlehem and the Golgotha of Jesus; the Roncevaux of Roland, with the cleft in the rock made by the sword Durandal; all are surviving testimonials of legends which were taken as true, but which invited the cold analysis of our day to undertake dissertations that sadly mutilated them. The multitude pays no attention. The only value in those witnesses to fabulous events lies in the strength of the dream that happens to be associated with them.

Homer goes back not much more than three thousand years. What shall we say of the preceding ages of which the Homeric poems are the more or less faithful expression? What of the unfathomable ages that went before? If, as some maintain, the man of Chapelle-aux-Saints is fifty thousand years old,[2] how many thousands of years must have elapsed before there appeared the first traces of a humanity which affixed to rocks vague symbols of its interpretation of things, symbols that contained the gleam of thoughts it could not express?

If we are to grasp the true proportions of things, what we especially need is to adjust our human standards of measure to the dimensions of the phenomena. Was it not quite natural to seek in the proportions of our own bodies

[1] Like a stripe across the stone floor, runs a groove to carry away the blood, which clearly indicates that the benevolent Apollo could be bought with the sacrifice of living creatures. So also his sister Artemis at Aulis in the case of Iphigenia.

[2] And that is little enough for such a transformation as has come to man since that day.

the scale of our measurements — thumb, foot, pace, ell? [1] Moses ingenuously assigned to one of the days of Genesis the task of completing geological formations requiring untold thousands of years which, however, the omnipotent Jahveh could have as well accomplished in the time of a lightning flash. When we come to determine the distances of the stars and the time they require to revolve in their orbits, the figures dumfound us. For the mere deposit of sediment geology requires measures of time in which we are quickly lost. It is the same with the history of man, in which the span of remote ages baffles us because we refer every period to the standard of our day, whereas the immense extent of time before history is beyond the compass of our measurements. Space and time are beyond us.

Young humanity, on the brink of those abysses, was moved to irrepressible emotion by the 'divine' character of the fables, while the head of the family accepted and even claimed the authority which they conferred. How, under the circumstances, could it do less than its utmost to perpetuate a tradition handed down from father to son, dealing with a matter of such capital importance to it as its own existence? The peoples of the earth did not hesitate to accept the fables. Refusal to accept them would be inconceivable, if infant man had not grown up, and if the human mind had not evolved. Dogma postulates an everlasting soul, yet man, who is expected to live by dogma, unquestionably changes. That is the key to the conflict.

The chief difficulty is that the evolution of mind has outstripped the corresponding process of eliminating the emotional heritage bequeathed to us by our primitive understanding. After having blocked the progress of knowledge, the *mos majorum* (the habit of the masses) fortified itself in the remaining strongholds of misconception in order to

[1] In French, a thumb (*pouce*) is an inch. We do not speak of a 'thumb,' but we still use that part of the thumb between the top of the nail and the knuckle as a rude equivalent of the inch. The foot (*pied*) is, of course, familiar. Like the French, we still speak of a distance as being so many paces (*pas*). The ell is the distance from the elbow to the tip of the middle finger. The arm-length is the old Biblical cubit. (Translators' note.)

bring into harmony with its conventions the surviving fictions that the assaults of observation, always slow to consolidate its strength, obviously threatened. Hence came all the contradictions of life which cause the cruel conflicts between what we think, what we say, and what we do. We suffer from a formidable entanglement of dreams, ideas, and volitions, in which every intellectual problem, and every social interest meet — only to obscure the first gleams of a misty dawn of truth.

Thus complex evolutions accumulated, advanced, reached their full strength, ever improving the man of the future through a mental activity in which thought became increasingly personal (with its inevitable tendency to vary). At the same time, cosmogonical legends, representing man's first attempt at thought, little by little became petrified in their symbols and antiquated. Such was the polar night of incalculable ages from which issued the phenomenon of consciousness through the perfecting of our associated sensations as the result of the continuing process of evolution.

If we were to venture among the cosmogonies of our contemporary savages — American Indians, Polynesians, etc. — we should find that the underlying themes of the fables differed less than the fables themselves. Identical incapacities were threatened by identical difficulties in knowing and by identical dream-shapes; meanwhile rude myths gave a wide scope for all the embellishments evolved from our common imagination. Why do we find Noah's raven reappearing in Algonquin legends? In this field we should be prepared for anything.

The Australians, we are told, have no cosmogony — a conclusive admission of inferiority! The Indians of South America have only a trace of one — indelible sign of an unmistakable mental sluggishness. All cosmogonies have the common trait of tending to reduce the universe to the smallest number of original elements. Simple ignorance and complex knowledge are both in quest of unity. Babylon gives us two contradictory cosmogonies, one of which worships water — the ocean — on the ground that it is the pri-

mary element. The cosmic ocean recurs in India, in Egypt, and in Greece. Meanwhile, along the valley of the Nile different cosmogonies appeared. At Elephantine we find the cosmic egg [1] of Asia, emerged from the mud of the Nile, whereas at Memphis the earth is said to have been shaped by a divine artificer.

We can easily understand why the Persian gulf and the two rivers of Mesopotamia should remain the key to the dreams of Babylon. Persia, with its Zoroastrian dualism,[2] which represented Ormuzd and Ahriman in a struggle resulting in the alternate victories of good and evil, has at least the merit of having sought for generalizations. The theological ambition of Zoroastrian unity resigned itself to two supreme gods, with, of course, the obligatory accompaniment of a multitude of sub-divinities. In our case that ambition can only be satisfied with a trinity.

The Egypt of the solar cult is, like Persia, fertile in ingenious myths that, with a poverty of metaphysical invention which attests the paucity of intellectual needs, require formal rites.

There are many Grecian cosmogonies. For Homer the primordial element is the Ocean; for Hesiod it is the Earth; for Epimenides, the Air; for Rhapsodes, the Ether; etc., etc. The Greeks, under the impulse of imagination, sought a natural law of the elements, thus attesting in them a superior need of coördinating. The cosmogonies of their poets contradict the cosmogonies of their metaphysicians. In the fragments attributed to Orpheus, in Hesiod, in Homer, and in Pherecydes,[3] master of Pythagoras, with his metempsychosis, we again and again find elements analogous to those which occur in India among the generations of divinities when at the height of their glory. However, poetical metaphysics, that is, a juggling of realized abstractions repre-

[1] Even Aristophanes speaks of the cosmic egg.

[2] The Avesta, the sacred book of the Persians, is written in Zend. Zoroaster was a native of Bactria. He came, therefore, neither from the Indus nor from the Ganges.

[3] Pherecydes repudiated the theory of sacrifices to the gods. Buddha taught the same doctrines at about the same time.

senting the personification of the unknown, inevitably impressed the general mind as a superior achievement. For such metaphysics, dreams opened an excellent field of flight. Thus the Greek, entangled in tendencies originating in the Orient, found himself constrained by his philosophical ideas to follow the Hindu tradition, which was to think metaphysically of the universe after having expressed it in myths.

After a long period of preparation, the hour of experimental philosophy dawned. From the most remote times, Ionia, mother of thought, had through Thales of Miletus turned the simple Hellenic cult toward the speculations of Asiatic pantheism. Empedocles, Democritus, Epicurus, and Anaxagoras, in doctrines resulting from the reaction against the poetic myths of the bards, had to a large extent written the epitaphs of the gods of Olympus. Plato and even Aristotle, seeking the nature of things, were bound with their future disciples, both Jewish and Christian, to overwhelm the old pagan poems with a flood of explanatory metaphysics, which, by its investigation into the phenomena of the Cosmos, accepted the task of finding logic in the illogical.

The prosecution of Anaxagoras and of Aspasia and the trial of Socrates, in which his enemies prudently abstained from doctrinal claims, spelled disaster for the gods, whom the terrible logician had put into a false position. Thanks to that same Socrates, to that same Plato, poet and formidable metaphysician, an Asian cult was reborn before which our friends of Olympus, already defenseless against the sword of Diomedes, were to surrender at discretion.

As soon as Socrates had undermined the pillars of Olympus with his incomparable dialectic, super-metaphysical enthusiasm let itself go in a Platonism that out-Heroded Herod. The cosmogonies of the stoics of the peripatetic school, and of Epicurus could offer nothing but mere affirmations, thus, in advance, condemning Aristotle to become the prey of the Christians. Next, Philo of Alexandria proposed to associate the idea of god with that of motion, to announce the unity of indestructible substance, and openly

to declare that creation is continuing and will always continue. However, through the agency of Plotinus the mysticism of the Hindus recovered something of its ancient vigor even among the Essenes, the Gnostics, and many others — to the sorrow of the Middle Ages and of our own. Having no sacred books, no dogmas, no mystic traditions, the Greeks and the Romans, embarrassed by their gods, decreed their own downfall by the massacres of the Circus. Faithful to the tradition of the Cæsars, Christian Rome tried by absolute religious autocracy to control thought by force — thus paving the way for the conquest of the Gentiles by Saint Paul.

We are told that having only one god is 'progress.' Is it? How can we find 'progress' in the shift from divine oligarchy to divine autocracy? In either case does not absolutism with all the resulting forms of slavery remain? The conviction of Anaxagoras and the death of Socrates are set down to the account of the 'pagans.' It is now generally admitted that it was primarily the rebellion against the worship of Cæsar [1] (Zeus in degenerate form) that spilled the blood of the martyrs. Those same Christians, alas, were to be responsible for similar crimes, but on a much greater scale. Theirs the responsibility for tortures, for *in pace's*, for massacres of heretics, for wars of religion, for burnings at the stake, for a total, indeed, of murders so formidable that it escapes all estimate. Was not Jeanne d'Arc burned as a heretic by the very persons who to-day have the audacity to exploit her? Through the work of a God of Love, Christianity must answer to us for Giordano Bruno, Berquin, Dolet, Servetus, Vanini, and for how many others! And what after all do wars of religion amount to in comparison with the tortures of eternity?

The fact is that man and his Divinity, using in their fury every weapon at their command, too long assaulted all liberty of conscience. The extreme favors or the extreme brutalities of governments, of churches, of drawing-rooms, of

[1] An inscription at Manissa on the Mæander gives Claudius this title: 'The greatest of the gods.'

the schools, or of the street — nothing that could impose silence upon the free activity of knowledge and thus promote the reign of fiction, was spared. When reason would not yield, every violence was unloosed. Galileo was sentenced to life-imprisonment *after he had abjured his error.* What a shocking confession of impotence it is when the 'judge' has to reverse himself! Let us admire the ease with which our religious leaders accommodate themselves to the fact.

And what have they accomplished? They have established the confusion of dogma, proved incapable of coercing the profound conscience of man; whereas experimental knowledge — shamed, cursed, persecuted, but nevertheless destined to ultimate victory — marshals its proud companies of courageous but tranquil minds intent on the liberation of humanity. Even to-day, in the hysteria induced by imminent danger, we pray that a storm shall end, that an earthquake shall cease; that is, we ask that natural phenomena shall undergo a cosmic reversal. But now that we have 'scientific' ways of irrigating there are fewer processions to implore that rain may fall in the fields.

Hellenism, to which we owe the better part of our mental make-up, bequeathed to us the treasure of the philosophic conceptions of Asia. Vitalized by myths of every kind, those conceptions left the precepts of natural morality to the analysis of the schools, which paid no heed to the gods whose function seems to have been rather to spur life on than to rule it. The question of a future life was never more deliberately disregarded. What can be said of the vague aspect of a shadowy Hades in which Ulysses and his mother could find nothing except pretexts for lamentation?

The task of building up general theories, whether of the individual or of society, reverted to the schools of philosophy. The Iliad, with its shield of Achilles, has left an admirable picture of human development in its first vigor; and the poem also spreads before us the suggestive spectacle of gods and warriors before the birth of philosophy.[1]

[1] On the vases of Vaphio are depicted the scenes of a wild bull hunt. The anatomy of the brute is good and in striking contrast with the crudely out-

After describing the toils of war, the Odyssey tells of the boisterous activities of the turbulent peace of those days. Here again the bards are the first to describe general conditions of life throughout the world. In the course of all his adventures, Ulysses finds not one thoughtful man. He meets kings, warriors, singers, goddesses, monsters — every prodigy, indeed, except a human being occupied in seeking the reason of things.

What were the rules of conduct? Violence, trickery, and lies, which Hesiod ingenuously commends as a means of ensnaring the public. When Ulysses asks hospitality of some great personage, the prospective host wishes to know who he is and whence he comes. The hero eagerly calls all the gods to witness that he will tell the whole truth and immediately launches on an ocean of lies. When he wishes to laud the father of Penelope, he describes him as 'ready with false oaths' — a eulogy that seems to him conclusive. Notice how on leaving Troy he pillaged and killed the Ciconians, although the war was ended, for no other reason than that he happened to meet them. The gods did not pardon him when, as in the case of Polyphemus, he attacked their offspring, but in regard to the Ciconians Olympus remained calm.

Imaginative 'knowledge' and empirical morality progress hand in hand. Orestes kills his mother, because she had killed his father, and in so doing he actually followed the counsels of Apollo. But even then the law that requires an eye for an eye could not have been the last word of human justice, for the Furies rushed in pursuit of the murderer. At the final trial the Areopagus withheld judgment, and it required the divine intervention of the partial Athene herself to bring about an acquittal.

I have called attention to the powerful flight of Platonic metaphysics, which, supported by Aristotelian naturalism, recognized that the finest speculations of Ionian philosophy,

lined figures of the huntsmen. A highly remarkable vase in the museum at Kandy depicts a procession of singing harvesters, led by a long-haired chief dressed in a coat of mail.

though they had a contingent basis in reality, escaped all verification. The general impetus of the Alexandrian school immediately carried away the whole of our Middle Ages, and still dominates the Christianity of to-day. Plato, the poet of metaphysics, and Aristotle, the inquirer into nature, will always remain in the front rank of great men. Yet neither could avoid floundering in the mystic formulæ of realized abstraction; one, by reason of the boldness of a most subtly refined imagination; the other, because of his methodical search for the realities of which he had caught a glimpse. Unexposed to experimental tests, the day of which had not dawned, the poetico-philosophical dream thus could take to itself wings. Plato by his own unaided effort created a metaphysical world in which ideas figured as entities, to which Aristotle, not in a position to build up a Cosmos based on observation, could only try to adapt the coördinations that he based on experience. Platonic metaphysics is a powerful buttress of the Roman church and has survived to our day. Even now our modern distillers of the transcendent are exhausting their supreme efforts to ornament it richly and to perfect it under the pretext of adapting it to experimental science.

I will not linger over the Romans, turbulent people the better part of whose nature tried to control its unruly complement by the invention of law. They had, nevertheless, the great merit of becoming the voluntary pupils of Greece — a circumstance which resulted in that swift advance of civilization from which Athens profited under the impulsion of Asia, as we ourselves also profited. Their Hellenized religion lacks the inspiration of its originals. Varro, Cicero, and Virgil are distinctly superior to their philosophy; and Lucretius, with his classic rhythm, stands forth as epitomizing conjectures which had a scientific tendency.[1] His labor was wasted. Julian himself with his Sun-King abandoned Lucretius and returned to the great myth of Asia.

[1] Some of his conjectures, like the hypothesis of the atom, found even in Manu and Sankara, master of the Vedanta metaphysics, turned out to be prophecies.

Finally, governed by the shifting fortune of military victory or by the corruptions of decadence, the whole Roman world threw itself into the final tragedy — the conflict between a religion, already dead in the minds of the Romans but still reigning in the conventional speech of society, and that vision of Asia, then at the height of its vigor, which in the guise of a Jewish heresy showed an 'intolerable' contempt for the pagan state.

Since Christianity was, as a matter of fact, a heresy tardily grafted upon the old Biblical trunk, it has no cosmogony of its own; like the coming Islam, it was obliged to be content with the Genesis of Moses. On that point no debate could be started with the Roman, who, indifferent to fictions, did not even trouble to choose between them. The gods themselves interested him only in so far as they were politically or socially useful. The Christian refusal to pay religious homage to the imperial divinity was what roused the beasts of the arena. The Christians died for refusing to deified Cæsar the grain of incense that was an insult to the God of the Gospels — died, that is, until the day came when the tables turned and the faithful followers of the doctrine of universal love, in ages of horror of which the cruelties of the French Revolution are merely an academic echo, drowned their own heresies in blood.

However, soon or late, the hour came when the authority of the great poets, who delighted the public, had to submit to the criticism of a picked few, anxious for scientific tests. Intellectual tradition prided itself on not examining into things too closely and was greatly perturbed. Between affirmation, dangerous, indeed, but impressive in its trappings, and the timid essay of an uncertain observation of appearances, the distance was so great that to the masses the gap seemed impossible to bridge. Can we affirm that even to-day that condition of mind has materially changed?

Since the first outcry of primitive man, the argument of our intellectual drama has remained unchanged in its broad outlines. Asia has preserved the memory of it in the legend of the Tree of Knowledge, the fruit of which the gods

strove to guard against the assaults of human investigation that, as Jahveh himself naïvely admitted, was bound to end in making man the equal of the gods. What a surprise it is to meet as far away as China that same sentiment of anthropomorphic jealousy in the divinity! What guilelessness in the Creator, the rival of his creature, who, he fears, has started toward too great an achievement! Since those days he has had time to reassure himself.

Even after the prodigious effort required for our first coordinations of knowledge, we can but admire the ingenuous boldness of the men who, without as yet suspecting the extent of the problem, threw themselves headlong into the emotional and incoherent explanations of the inexplicable. It does not surprise me that they should have succeeded in imposing their imaginative propositions on men of imagination. What may be regarded as astonishing is that 'enlightened' men of our own times should still be trying to uphold obsolete dreams as against knowledge derived from science and always open to correction.

After all, to claim that the world was made by the will of superhuman Powers is not so difficult, if, having paralyzed verification, you do not hesitate to make sweeping statements. Since no one hesitated to say what he was in no position to know, man's intuition inevitably led him to construct identical theogonies rich in names and poor in ideas, which soon lapsed into the formulæ of metaphysics, which, for lack of any standard, are the false coin of ideas.

The conception of experimental control has prevailed, or, rather, is on its way to prevail. However powerful it appears in the field of knowledge, it remains null and void and even impertinent in the domain of the imagination. Experimentally proved facts are required for the constructions of thought, but are excluded from any share in the formations of fancy. Shall we base two distinct and discordant lives on contradictions which lead to intellectual confusion, or shall an integral Ego triumph over that incoherence which exhausts the best part of our vital force?

INDIA

It would be idle to compare the supreme struggle between Roman Hellenism and the Christianity of Judea with the collapse of the Brahmins under the onrush of the Buddhists. Their victory was followed by a counter-offensive which brought back the Vedic gods as on a tidal wave. By that return flood the Buddhist sediment, undisturbed for a thousand years, was quite submerged.

Centuries of a religious autocracy more meticulously despotic than any previous autocracy had reduced the people of India, more inclined, indeed, to dream than to act, to the point of apathy. Conquerors of the princely caste of warriors (Kshatriyas), the Brahmins, after a period of repression in which blood flowed in torrents, abused their unchecked power until the day when revolution disarmed them. After many premonitory signs, the Buddhist revolution appeared, but, contrary to what might have been expected in other lands, it was a revolution rather of natural philosophy than of political reaction.

To the pantheistic metaphysics of Kapila fell the honor of supplying the theme of that restoration. Without a soul, without a god, without prayer, Buddhism, codifying the laws of that transmigration of beings which is symbolized in the image of the Wheel of Things, sought its path outside the Veda. After the brilliant period of the Emperor Asoka, Buddhism, a reaction of naturalistic metaphysics, was first worn down by the lasting opposition of the old basic myths and finally expired simultaneously with the rebirth of the Brahminic pantheon, supported by the sacred writings so long in abeyance.[1]

For some reason, the religious phenomenon of India was not confined to the vast plain between the sea and the

[1] One day at Singapore I asked a celebrated Chinese, a doctor of Oxford, why, when China adopted Buddhism, the old and the new religions had been as it were fused.

'That,' he told me, 'was because doctrine too often yields to the inherited habits of the imagination. By making over our ancient gods on the Buddhist model, we saved the philosophic thought of Buddha. Because the Indian Buddhists did not do the same, they inevitably assured their defeat.'

Himalayas, and between the Brahmaputra and the Indus River. Between India and Persia the interchange of thought goes back to the remotest times. That the most ancient written characters of India were of Iranian origin seems to be established. In many respects the development of Persia and of India is identical. Although Zoroastrianism is of earlier date, Jainism and Buddhism belong to pre-Christian history, and Christianity, a Jewish heresy, was their western echo. The great Indian emperor, Asoka (a hundred years after Alexander), vigorously promoted his Buddhist missions in Egypt, in Greece, and in Syria. At the same time the Bactrian dynasty, the result of Alexander's conquest, was carving the Græco-Buddhist figures of Gandhara, and striking medals, the legends of which were in the Greek or in the Indian language. In the inscriptions on the pillars of Asoka students have recognized the inspiration of the Achæmenidean texts, characteristic of the inscriptions of Darius. Menander, a true Greek, one of the princes of the Bactrian dynasty,[1] was converted to Buddhism. A revolution declared itself in the minds of men. Christian thought had started on its way.

Such was the origin of that great, deep Asian wave that, through the propaganda of Saint Paul, and through its annexation of the holy books of Judaism, was to fill and overflow the Mediterranean basin with a new power. Does not King Gandophares, whose realm extended to the eastern bank of the Indus, reappear as one of the Magi who came to worship the Infant God in his cradle? Thus can we follow the course of one of the greatest phenomena of our historic evolution — the prodigious surge of the irresistible tidal wave that, boiling with Asian idealism, dashed against the Mediterranean shore and submerged the glory of Græco-Roman culture under the surging waters first of Christianity and then of Moslemism.[2] The powerful reaction of the

[1] Bactra, in spite of being Persian and the supposed birthplace of Zoroaster, had become the capital of an independent Greek kingdom.

[2] Of this event Sylvain Lévi in his excellent little treatise, *L'Inde et le monde*, gives a summary sketch.

Far East to Indian thought that, by way of closing the world-wide circle of emotion, carried Buddhism to China, to Japan, and to the Malay peninsula, completes the picture. Thus was consummated a human achievement which can never be surpassed except by the unanimous adherence that the formal pronouncements of positive science should, and ultimately will, obtain.[1]

The natural tendency for those who wish to discover what tenets of Brahmanism have survived in the cults which derive from it is to shift their consideration from its original forms to its echoes in later history. The important phenomenon of Vedism has hardly begun to be elucidated, and since the doctrine is so colored with emotion as to be almost concealed, the result of seeking in it the basis for a purely doctrinal discussion would be to distort that incomparable movement of mental evolution in which human thought reached its apex. Doubtless the organic uniformity of different mentalities imposes common intellectual characteristics upon them. But the original source of those impulses in humanity that throw the man who will not compromise to the beasts of the arena and to the tortures of the scaffold, does not lie in that uniformity. People do not generally face fire and sword for the sake of a purely scientific problem. The retraction of Galileo made that clear. A man of science will sacrifice his life hour by hour to the elaboration of a scientific statement, but at the same time he will too often make every concession to religious formulæ which will establish peace between him and such part of the social conventions as he needs to pursue his work. However, men predominantly emotional will sacrifice everything to make an idea prevail. No price is too high for them to pay in order to promote a higher volitional state — a promotion in which they will claim not even the glory of having collaborated.

[1] Vedism and Buddhism were driven from Persia and from the Malay peninsula by Islamism. Java is supposed to be Mohammedan, though I saw no mosque there, and though the women do not wear the veil. On the island of Bali at the eastern end I witnessed a Brahmanic ceremony with dances of monsters like those of Tanjore. The women were not merely unveiled; they wore no clothing above the waist.

Nothing, then, could be more futile than to seek for any purely spiritual connections, outside certain ritual characteristics, among the great religious movements which succeeded one another, only to oppose and excommunicate one another. A good history of Christian heresies and of the creeds that developed from them would show us for what paltry verbal quibbles our dogmatists have fought each other to the death.

However, very prolific in miracles, Brahmanic India, the initiator, stands out as mistress of future civilizations, through its brillant conception of the cosmic wheel and of metempsychosis, the postulates of which modern science had but slightly to modify in order to formulate its law of universal evolution. At that point the metaphysics of India came very close to a union with positive science. When we see Indian metaphysics, complemented with the Vedic doubt from which India derived its universal practice of philosophic tolerance, we are forced to recognize that no other country has held so eminent a place in the history of thought. So far as we are concerned, what does it matter if Hindu metaphysics chose to see in the world only illusion and lies, and that it discovered the absolute in existence *qua* existence? So to believe was to invert the relations of the cosmic frame and of man whom it includes. That was the original misunderstanding of elemental action which, for reasons I have given, constituted the original foundation of the oldest 'philosophies.' On the other hand, when we are told, as Hindu metaphysics tells us, that 'every act is the moral result of an immeasurable series of preceding acts and the starting-point of an immeasurable series of other acts that will be their infinitely transformed effects,' [1] we find ourselves at the heart of the doctrine which declares the universal interdependence of things.

Does metempsychosis mean to conclude from that principle that the system of acts which makes up the temporary personality of any given man is transformed into another such system which continues the first by setting up in each

[1] Sylvain Lévi.

of his successive incarnations a new temporary personality on which retribution may be visited for all the evil for which he may be responsible? That distorted view of the world (Brahmanism and Buddhism) has at least the advantage of putting man into his cosmic frame in contradistinction to metaphysics, which can exist only in the bosom of unreality. 'Kama' (Eros), over which the simple-minded become so exercised, thus reduces itself to a mere symbol of the unending power of the act determined upon and immediately starting its chain of consequences. It is the decree of cosmic energy, on which man has no hold except through the meritorious actions that permit him to escape the miseries of a new incarnation through the blessed aid of death — supreme recompense for having achieved superior virtue. Under that name of Kama you have our modern determinism in its most sharply defined form. Christianity, which tries to take man out of his cosmic frame, is not so enlightened. As a matter of fact, Christianity explains the world only by postulating an exercise of supernatural will. It leaves to science to determine the scheme of its progressive development; but on that scheme, when once discovered, it reserves the right to pass judgment. It was that pretension which led to the prosecution of Galileo.

The fairy tales of the Mosaic cosmogony are very different from the Vedas with their lofty inspiration. The Hebrew needed no more than a nursery tale to forge a link between his 'Eternal' and humanity, for whom that 'Eternal' created the universe. The Indian could not satisfy himself so cheaply. He had to have a metaphysics of the universe as well as of Brahma himself — Brahma who 'exists by his own agency,' but who, in logical identity with all the gods who emanated from his proper substance, is a transient emanation of the Universal Being (Brahman).

Resting on the same substratum of thought,[1] the two

[1] The Upanishads have a cosmogony. 'The sun is Brama. In the beginning the whole did not exist. He existed. He metamorphosed himself and became an egg. At the end of a year, the egg split in two. One half the shell was gold, the other silver. The silver is the earth; the gold is the sky.'

principal cosmogonies that have come down to us from India (the Vedas and the Laws of Manu) gave birth to absurd myths. They are far indeed from the arid simplicity of the Bible, which so cheaply satisfied the Occidental mind — thanks to its obstinate resolve to keep its eyes shut. I have spoken of Brahman as being superior to all other personal gods. In his capacity as the universal power, he was more than other divinities recalcitrant to cultural personification. However, he, too, ended by foundering in it, but only to reappear at once under the name of Atman (breath, spirit), the source supreme of all energy.

The Hindu of the Vedas conceived the world as animated by inner meditation, which, according to the Rig Veda, produces the activity of Kama (desire).[1] Hymns attributed the creation of the world to other divinities, and the Brahmins offer us the cosmic egg (as do also Egypt, China, and Polynesia), from which issues Brahma himself, from whom in turn issued the gods and the world. Let us leave imagination to lose itself in this impenetrable jungle of lawless abstractions!

India, through its Vedic hymns and its other great poems, in which we discover unexpected analogies with the literature of Greece, was characterized by an overflowing emotion that among the windings of the most hair-splitting metaphysics, had become miraculously subtle. The stroke of genius in it is never formally to reject any affirmation so as to sharpen the promulgated faith with a touch of doubt. The cosmogonies of India are beyond number. In them have accumulated every sort of contradiction, without exhausting a trustfulness always ready to assimilate whatever may be offered. What more could any one ask in the way of comprehensiveness? A man might as well cast himself into the sea in order to catch a bubble of foam as to seek to penetrate this mythology in order to establish any experimental truth.

I will simply cite a single passage from the famous hymn

[1] Designated by our naturalism as *need*, profound source of all activity. Whence the formula: 'The need creates the organ.'

of the Rig Veda which gives some idea of the abyss of Hindu thought:

'There was no existence, no non-existence, no air, no sky beyond the air.
'What covered all? Where rested all? In the water of the abyss.
'There was then no death, no immortality, no alternate day and night.
'The ONE breathed amid the calm, depending only on himself. There was nothing else besides.
'Obscurity, buried in obscurity, was at the beginning a sea that the eye could not encompass.
'That ONE, emptiness wrapped in chaos, grew great from an inner heat from which in the beginning desire leapt forth, first germ of the spirit that nothing binds to life, as wisdom-seekers have discovered.
'The jet of flame that sprang across the dark and frightful abyss — was it beneath, above, midway? What bard can answer the question? In that flame were found the powers of fecundation, and measureless forces were at work. An autonomous mass was below and energy above. Who knows, who has ever said, whence that vast creation issued? No one of the gods yet was who might unveil the truth. Whence sprang the world? And whether it was framed by a divine hand, its Lord in Heaven alone can say, and *perhaps even he does not know.*'

Fuller still, and perhaps more vigorous, is the version of this important passage given by Max Müller in his essays on the history of religion. I unhesitatingly put it opposite the original text that the reader may compare every varying shade of meaning:

'This that I am about to ask thee: how did the present better life appear, answer me truly, O Living God. By what means must the things of the present be sustained . . .
'This that I am about to ask thee: at the beginning who was the Father and the Creator of truth, answer me truly, O Living God. Who made the sun and the stars? What other than thou madest the moon to wax and wane? All that except what I already know I wish to learn.
'This that I am about to ask thee: answer me truly, O Living God, thou who holdest up the earth and the heavens above the earth. Who created the waters and the trees of the field? Who is in the winds and in the tempests that their flight is so swift? Who created them that are virtuous and just, O wise God? [1]
'Then nothing existed, neither being nor non-being. The shining sky was not yet, nor was the wide canopy of the firmament spread above

[1] And elsewhere: 'Who is the God to whom we offer sacrifice?' 'Who is the greatest of the Gods? Who should be glorified first in our hymns?' etc., etc.

it. In what was all wrapped, shielded, and hidden? Was it in the unfathomable depths of the waters?

'There was no death and no immortality, and the day and the night were one. The Unique Being breathed alone, exhaling no breath, and since then there has been nothing other than Himself.

'There was obscurity, and at the beginning all was plunged in profound darkness, an ocean without light.

'The seed that still rested hidden in its envelope suddenly germinated through intense heat. Then for the first time love, new source of the spirit, came and united with it.

'Yes, the poets, meditating in their hearts, discovered the bond between created things and things uncreated. The spark that darts everywhere, that penetrates everything — comes it from the earth or from the sky?'

'Then were sown the seeds of life and the great forces appeared, nature below, the power and the will above.

'Who knows the secret? Who here has told us whence came this various creation? The Gods themselves arrived later at life. Who knows whence this vast world was drawn? He who was the author of all this great creation, whether his will ordained it, or whether his will was mute, the Most High "Seer" who dwells in the highest heavens, is he that knows it — *or perhaps he himself knows it not.*'

What is more moving than that terrible temptation to doubt which never ceases to haunt the bard at the very hour of his homage to the Powers of the Unknown: 'Who saw the first-born, when he who was without bones [that is, without form] sustained him who had them? Where was life, blood, the Atman of the world? Who has gone to ask that question of some one who knows?'

What is perhaps most remarkable in this explosive manifestation of the first perplexities which tormented human intelligence is the outpouring of questions asked rather than answered. We meet quite the opposite in the exhibitions of later thought at grips with the unfathomable Cosmos, for in that thought artistic spontaneity delighted in questions answered before they were asked.[1]

[1] It is necessarily surprising to find the same kind of Vedic doubt injected into the Proverbs of Solomon, even to the supreme stroke of the ultimate 'if': 'Who hath ascended up into heaven, or descended? Who hath gathered the wind in his fists? Who hath bound the waters in a garment? Who hath established all the ends of the earth? What is his name, and what is his son's name, *if thou canst tell?*' Proverbs, xxx, 4.

It is well to observe that, though attenuated, the same type of questioning reappears in the most ancient hymns of the Avesta — a fact that is not surprising, since the body of Zoroastrian thought was originally imported into Persia from India.

Am I wrong in maintaining that in comparison with this Indian cosmogony the Mosaic Genesis is little more than a tale for children? Many extracts identical in inspiration could be taken from the sacred books of India. I have cited the foregoing passage because I find curiously blended in it a lofty poetry of the world and the highest leap of sceptical affirmation of which the human mind is capable. With its Brahman [1] (the Universal Being, the Evangelic 'Word'), with its Atman (the breath, the universal soul, the self, the essence of the Ego and the non-Ego),[2] India made its finest effort to reach the ineffable summits of that omnipotent power in the cycle of which Brahma himself progresses.[3] We find the idea once more in the law that subjects the Zeus of Æschylus to Destiny. As to the 'Universal Being' and the 'universal soul' which became confounded in the 'Ego' and the 'non-Ego,' India liked to maintain that they could be defined only by denying them every attribute, that is, by saying that direct reaction to them through our senses was non-existent. Thus, in the Hindu mind, there was room enough for the diversions of an infinitely subtle doubt. That doubt allowed it to blend every contradictory conception in its mythic entities and saved it from intolerance.

The truth is that at the frontiers of thought, where the flood of dreams beats on the unexplored shores of the unknown, those two lofty manifestations of the mind of man, poetry and metaphysics — and music may also be added — have an identical use, namely, that of giving inspiration. If our metaphysicians, instead of shutting themselves

[1] A simple change in accent gives Brahma (neuter) objectivity; and Brahman (masculine) the Universal Being who represents objectivity.

[2] See Atman, Brahman, *Encyclopædia of Religion and Ethics*.

[3] Independently of the observation of nature, which shows us the Ego included in the non-Ego, the desire for knowledge that forces us to objectify ourselves is the clearest possible avowal of a fusion of subject and object.

within the sorry limits of their uninspiring prose, had, as in the old days, imposed upon themselves the law of rhythm and of melody, there could have been no possible mistake about the objective reality of their themes, and we should have been spared many a vain discussion. Notice to whom the author of the Vedic hymn addresses himself for the solution of his super-metaphysical problems — to a bard, to a singer, to a poet. Is not the significance clear? In an age when Vedism offered man the poems and songs of cosmogonies with which Greece itself was in its turn to resound, where could one find a man of science? Galileo, Copernicus, Newton, and Laplace were to work on a different plane of thought. Our metaphysical poets achieved nothing beyond picking up by independent effort the old task where our ancestors had dropped it without being able to carry it farther than had the Aryan of the Veda. In all that beating of metaphysical wings what is most obvious is the misplaced mode of explanation: it produces music instead of scientific knowledge. If Plato's works were only sung to me . . .

The detailed cosmogony of the voluble Manu tells of 'Him whom the mind alone can see' producing a germ that becomes a 'brilliant egg' from which He himself is reborn as Brahma (creative energy of Brahman), the great ancestor of all the worlds. That procedure would have required only one of Brahma's years — say 3,110,400,000,000 human years. The egg opened and the upper half became the sky and the lower half the ocean. All the rest followed with a phantasmagoric luxuriance unknown to the Hebrew.

It should be noted that according to Manu, the creation of the world is not the effect of divine caprice, for, in order to be produced, the phenomenon required that 'the period of dissolution should first be accomplished.' There was, then, a preëxistent law that will resume control of the egg-born Brahma, together with the world itself, whenever the cycle of our universe is complete. Of that universe in 'dissolution' was born, first, consciousness, or the 'Self,' and then the exterior world that is the frame of man — man who sprang from different parts of Brahma's body according as his caste was

high or low — and finally Manu, the 'creator of our universe,' that is, creator of 'lives of every quality from holy personages down to the evil genii themselves.'

It may be said that the moral and social cosmogony fill the whole book of 'The Laws of Manu.' It begins with the words that the Evangelist was to repeat: 'Love of self is not praiseworthy,' and to them it adds others unknown to Christianity. We must, it says, fulfill the prescribed altruistic duties 'uninfluenced by the hope of recompense' — an addition that reveals a notable superiority over the Christian, whose principal object is to win an eternal reward for a transient submissiveness. Manu in his superhuman words puts the practice of morality above recompense and offers inner satisfaction as the supreme ideal. Ponder this well, if it is in your power, O excellent Christians whose simple zeal does good works only to gain the dreary felicity of a paradise of which no one can conceive!

It is evident that the cosmogony of the Rig Veda is superior in refinement to that of Manu, although the latter constantly identifies itself with the Sacred Book. The fact is that the order in which doctrines are transmitted is not necessarily the order in which the successive cosmogonies appeared. It is not certain that Manu drew exclusively from the Vedic spring. We do not know the origins, whether written or orally transmitted, of his information. At the beginning, 'the imperceptible world, stripped of every distinct attribute, could neither be discovered by logic nor revealed: it seemed to be entirely given over to sleep.' Everything had, therefore, to be created. He created everything.

Another form of Vedic cosmogony is that of the 'Aitereya Aranyaka.' It argues that when HE conceived the idea of creation, the universe was nothing but soul, without either activity or non-activity. Then the full cast of realized abstractions, like Hunger and Thirst (Kama, Desire), entered upon the scene to claim the rank of deities, which they immediately obtained. HE, the universal soul, seeing man exercise all the functions of physical and intellectual life,

quite apart from continuous divine intervention, asked himself how the thinking human body was able to exist without him, the active principle of the universe, and put to himself this important question: 'WHO AM I?' The answer at which he arrived was that all life is the eye of intelligence, the intelligence being Brahma, the great ONE.

Throughout the sacred books there are interminable discussions on Brahman, Universal Existence, and Atman, the Self, the Soul, that ultimately re-unites with Brahman for the purpose of complete fusion with him. The Atman is the Infinity of Anaximander, the essence, the entity of Parmenides and of Plato, the νους of Aristotle, the substance (as distinguished from the form) of Spinoza, the thing in itself of Kant, a principle of which we can say nothing except what it is not. How can we be astonished at terms from which meaning has so completely evaporated, when men seek full understanding of the world in 'personality,' which, perhaps, is nothing but a form of expression?

The Veda did not go beyond the Atman, of which it could never tell us anything except what it was not. From the Atman came the Holy Ghost, the Word, of which we can give no account, and later the Universal Unconsciousness, which the gods bitterly decried as tempting the weak to adopt fatalism and indifference. In his distress man went through all that, only to end with Sakya Muni and with Christ, that is, with a man-god, a prophet deified in spite of himself, so that man might 'realize' in himself the unchangeable absolute.

However, words have survived, and man prizes them all the more because he feels that they are profoundly his own, even though he lets them fly far beyond the realm of reality. Indeed, words seem to us to have so convincing an appearance of actual life that their progressive change in sense escapes us, and that the masses — because of their emotional suggestions — obstinately refuse to part with them.

We have, nevertheless, seen the terrible Jahveh himself crumble and wear away under the decisive proof of the lack

of foresight, the mistakes, the defects of knowledge, the poverty of feeling by which he was inevitably bound to expose himself. He has melted and dissolved in the sum of things, and everything that the freakish despotism of the personified god has lost, the other, Atman, has gained, because under the aspect of unconscious cosmic dominion, the impersonal deity remains the ultimate power. Thus, the idealistic impulses that created the Divine Power were able to survive in their full strength in our heart of hearts, through the inward virtue of a term that fixes the irreducible minimum of human aspirations when freed from the contradictions that the divergence between the absolute and personality brings in its train. The ideal, purged of personality and thus immeasurably dignified, remains as an invisible point for us to aim at — as the magnetized needle points to the pole.

It will surprise no one to hear that in the Upanishads Atman and Brahman are often used interchangeably to express the essence of the Ego and of the 'Itself' (of Sankara), that represents the exterior world. In so subtle a matter we must be prepared for anything — first, because everything is based on rigorous verbal analysis, and second, because language could not develop through general usage without exposing words to the danger of overlapping one another in sense and often even of coalescing.

It would, therefore, be an error to believe that throughout thirty centuries of religious inspiration deriving from Brahman, the word itself has always kept the same meaning. Like the word Atman itself, it obviously evolves in the sacred books. It is, moreover, by no means certain that it represented a conception closely resembling the one that we try to give it to-day. Such is the history of all words, because they represent a continuous expansion of thought. As to Brahma, from whom the world emanated, he is merely the theoretical god of an esoteric doctrine unknown to popular worship. I have mentioned that to-day only a single temple to him remains in India. It is doubtful whether he ever had many. Nevertheless, in the Hindu Pantheon

he holds the place of honor. That satisfies the Indian people, who have never unanimously recognized him as the supreme divinity.

For us, the unexpected thing is to find that the Indian mind should have ended by casting a too categorical assertion of the divine personality into the scales of doubt, for fear, we may believe, of not having sufficiently exhausted the hypotheses of a debate in which prudence required that special homage be paid to the unreachable unknown. To make that decision was to rise instantly to the highest plane of intelligence — an intelligence aware of a light that it had at most barely glimpsed. However, Brahma, from whom the world emanated, was made subject to evolution through having a cycle, whereas, Brahman, Universal Being, and Atman, universal soul, seem to have escaped the law.

Among the Jews Jahveh, wholly preoccupied with making a 'good' world, created man and the universe *ex nihilo*,[1] and, having taken pains to make man fallible expressly to expose him at once to the temptation to fall, made him cruelly expiate through all eternity Jahveh's own dread of responsibility. The next episode of human history is the crime of Cain, from whom Jahveh had withdrawn his favor even before he had committed any sin. Tardily Moses was to receive on Sinai the divine commandments (including the commandment, 'Thou shalt not kill'). Most ungraciously were they welcomed by the 'chosen people,' dancing around their Egyptian calf of gold.

Not until we come to Jesus of Nazareth, who knew no other divine power than that of the 'Heavenly Father,' do we find the recommendation to brotherly love renewed. The unfortunate preacher paid with his life for that subversive word, and for having listened to it Christians were condemned to expiate their faults through the or-

[1] Philologists who rank as authorities assert that the creation *ex nihilo* is merely a fault in translation since the word 'bara' means to 'fashion,' to 'model,' and not to create outright. India, as we have seen, was content to speak of an emanation.

ganized massacre of their brothers in the faith, in the name of the very one who had enjoined them to love one another.

In the matter of justice and kindness the Old Testament recognized nothing beyond the savage penalties of the law of retaliation. In spite of which those same Christians, whose God suffered death for having preached pity, still keep on seeking standards by which to measure so-called human responsibilities that belong only too clearly to the Divinity. The Vedas exhausted their distinctions in the search for the same terrestrial justice, but, unfortunately, were preoccupied with setting up penalties that should vary with the castes which might happen to be offended.

In Vedism all lives are strictly linked to one another in accordance with the action of successive change, symbolized for us in that eternally revolving Wheel, which represents the combined activities of the elements. Is not that precisely the profound view of our modern science, which extends the spokes of the wheel even to the unsearchable depths of phenomena? Even here science and religion unite, except that our present knowledge is always the result of tested experiment, whereas the Hindu hypothesis of the transmigration of souls runs against contradictions of which Buddhism — for which the doctrine is fundamental — can never rid itself.[1]

The cosmogonies of primitive man do not bother themselves about so many things. Far indeed are his preposterous fables from the bold explanations of the Veda! And yet they did no more than prepare a starting point for the human mind on its journey toward a coherent whole of human knowledge, the function of which is to govern our lives consistently with the relations of the elements. Such, indeed, is also the claim of Buddhism, although the Master

[1] When the existence of the soul is explicitly denied, the theory of its transmigration seems difficult to accept. We are told that the Buddha grew angry when any one spoke to him of the soul. As a matter of fact, he considered it a capital doctrinal flaw. Unfortunately, the great prophet doubtless thought that something would be forfeited by too clear an explanation. On the phenomenology of transmigration Sakya Muni remains dumb.

never expressed his views of the cosmogony proper.[1] Buddha did not write. A text of four fundamental lectures, which may be authentic, has come down to us. Everything else that we have consists of the diffuse commentaries in which the philosophic vagueness of the Hindu mind loves to stray.

Sakya Muni's attitude toward the Vedas is much the same as that of Jesus toward the Old Testament. If by implication he accepts the sacred books, he takes no pains to restrict himself to them. He came to fulfill the 'Law,' called by Manu: 'the sovereign decision dealing with the punishment destined to all that which is endowed with the power to act.' However, if the Vedas, or if the Old Testament, had been enough in themselves, there would have been no need either of Buddha or of Jesus.

Atheism (Natikya) is expressly condemned by Manu. Therefore, it must have existed. But it showed itself less by direct denial of the Vedic gods — unrestricted flights of poetry — than by a refusal to admit the verbal world of abstraction turned into entities, into which the metaphysics of India rushed. Buddhism is careful to avoid the classic gods, who are themselves merely emanations of Brahman, Universal Being.

'The Soul,'[2] said Manu, 'is the assembly of the gods.' 'The universe rests in the Supreme Soul. The Soul causes the series of acts which animate beings accomplish. . . .' The Brahmin with the aid of meditation sees the great Being as the sovereign master of the universe, as more delicate than an atom, as being as brilliant as the purest gold, and as being impossible for the mind to conceive except in the complete inaction of the most abstract contemplation. Some adore him in the element of fire; some in Manu, lord of creation; some in Indra; some in pure air; some in the

[1] There must, however, have been a cosmogony. Questioned by Ananda on the cause of earthquakes, Sakya Muni responded: 'The great earth, O Ananda, rests on the waters, the waters rest on the wind, the wind rests on the ether. When it happens, O Ananda, that contrary winds blow above the ether, they agitate the waters and the agitated waters cause the earth to move.' (Burnouf.)

[2] That is, the universal soul.

eternal Brahman. He is the god, who, enveloping all beings in a body formed of the five elements, causes them successively to pass to dissolution in a progression like that of a wheel. Are we not here very close to evolution?

It is evident that Manu knew the atom. Between his Universal Soul and our present doctrine of energy there is little more than a verbal distinction. In speaking of the atom he prefaces his remarks with an explanation of the transmigration of souls,[1] in which he tells us 'that the distinctive mark of goodness is knowledge!' Have I not called attention to the fact that, in spite of certain appearances, knowledge and morality have a general tendency to march hand in hand? If people are deceived on that point, the reason is that knowledge is assimilated in varying degrees, and that, on the other hand, since verbalism passes current, the feeling of which words should be the sign is slower to become genuine. For a man must above all else *feel* in his heart of hearts if he is to *act*, that is, irrevocably to will, so as to achieve a happy activity in harmony with the universal order. He must, I say, will with disinterestedness — a moral conception to which Buddhism attained no more

[1] The first result of the doctrine of the transmigration of souls was the interdict against killing animals. In India the principle is maintained as a matter of good form. Not only is the Brahmin supposed to abstain from eating any kind of flesh, but you will see people walking on the roughest parts of the road in order to spare insects, which prefer the beaten tracks. However, Buddha died from indigestion caused by eating pork, and the common sophistry is content to explain the interdict by alleging that any one may eat the flesh of an animal, *provided he did not kill it himself.* It does not necessarily take an authentic Jesuit to be jesuitical. We know that the goddess Kali is thirsty for blood. Usually she receives that of a kid. The sacred cow has triumphantly succeeded in getting out of the scrape. There is no question of killing her. I have, however, seen her get some smart raps when she became too enterprising. When a cow passes, the shopkeepers cover the fruit in their baskets with a handkerchief. That is the limit of their defensive measures. But if the sacred cow lies down in the middle of the street, no one dares disturb her. The sacred hymn compares the clouds to celestial cows whose udders Indra, the solar god, pierces with his arrows in order to sprinkle the earth with the divine liquid that fertilizes it. Mere poetics! English Residents have told me that they gave up having beef on the table so as not to scandalize their servants. Except for Balaam's ass, the raven and the dove of Noah, the she-ass of Jesus, and Jonah's whale, our Judeo-Christianity ignores animals. We had to wait for laymen to recommend kindness to them.

than does our own Christianity, whether of yesterday or of to-day.

The fate of Buddhism was necessarily such as the emotions rather than the intellect decreed. To build up a religious metaphysics and then to make it vital in the dim, but authoritative 'understanding' of the people who claim that they put it into practice, are two quite different things. I have briefly outlined the leading principles of the great reform of Sakya Muni — no gods, no soul, no prayer. To-day the worship, or, if you prefer, the veneration, of images and of relics [1] takes the form of the offering of a flower and of a libation. Meditation is carried to the extreme point that mental power permits and results in a life of asceticism and poverty, adopted for the conquest of 'merit,' which, in the course of the transmigration of souls, will lead to the supreme reward of annihilation.[2]

A small group of enthusiasts in the immediate train of the Master for a while may have maintained, and even strengthened, the doctrine by the happiness they derived from living at the top of their emotions. But feelings, thoughts, and especially deep-seated desires, do not necessarily conform to the fate of the words that, more lasting than they, attempt to represent them. After Buddha's death, his disciples undoubtedly began by rallying around the words of the Master, as after Golgotha the disciples of Christ tardily rallied around his teachings. Only, since emotions and thoughts derive from man, their length of life depends on the activity that expresses them, and such words as survive in the emotion or in the thought which created them acquire only too easily a modified meaning. Schools were to be founded on a constant tumult of disagreement which the Indian mind refused to carry to the point that we reached in our hatred of heresy. The 'war of the relics,' fought for the possession of the remains of the Master, showed that the spiritual legacy of Sakya Muni would be

[1] See Burnouf, *Introduction à l'histoire du Bouddhisme indien.*

[2] I prefer to call things by their right names. Cf. Burnouf. Nirvana is nothing if not the end of sensation.

forced to yield to that cult of materialized divinity so despised by the great ascetic. On the other hand, if the original thought was to survive, a perpetual rebirth of Buddhas was required. The case was the same with Christianity, which, to retain the purity of the Nazarenean teaching, would have required the continuance of superhuman inspiration. By way of contrast, observe the fury of the religious persecutions, carried on for the sake of metaphysical dogmas, but never for even the partial achievement of the moral conduct which those dogmas taught.

The great formulæ of universal idealism came to us from Asia; and Asia itself could not realize them in its life, except in a vision that does not end. We of the west have verbally transformed Asiatic idealism — as far from realization as is our own — into rites that with us usurp the place of the conduct it recommends. Our Christians go to mass, but they do not give their property to the poor as, nevertheless, they have been admonished to do.

Buddhism maintains its ascendancy in Thibet, in Burma, in Siam, in China, in Japan and in Ceylon, where the virtue of the original teaching is not completely dissipated.

In India flowers are the supreme offering to the gods. They delight the eye at the entrances of all the temples. Burma rejoices in a superabundance of them. The Pagoda at Rangoon baffles description. Between wooden frames for the display of flowers, from which little children pluck handfuls of lotuses for the believer as well as for the pagan visitor, one reaches an immense platform over which swarms a confused crowd of mortals and gods. Buddhas in every conceivable shape of wood and stone await in joyous gravity the offerings of casual homage. Then come more statues, chapels, sanctuaries beyond number, lofty cathedrals of gilded wood enriched with every refinement of Oriental carving.

Their innocent nudity wrapped in clinging silks, young Burmese women, smiling sweetly under the diadems of their black hair, come to present their little doll-like babies to their god. They prostrate themselves, they touch the

ground with their foreheads, they leave a flower, and the god is content. Our own god is not so cheaply satisfied. Whether it is enough to pay this homage to the first Buddha you come across, or whether you must make an offering to successive images depends on the vows you may have made. Every one follows his inclination. In the compact crowd, every one, smiling amiably, spreads the courteous glow of a gentle good-nature. Everything bears witness to the perfect contentment of simple minds in full possession of the ultimate truth of things.

Everywhere little shops cater to the needs of coquetry. In full view of an indifferent public, young women add a final touch to their draperies and even freshen the bloom of their faces with a light brush that they may appear before the god in the perfection of their beauty. The curious halt before the shifting displays of merchants. Some people, sitting on the ground, eat their luncheon. Here and there are flocks of tame pigeons to which you may toss a handful of grain. Such an action will be to your profit, since having helped your 'neighbor' constitutes a 'merit,' which will infallibly save you from an evil stage of metempsychosis. In India, the word 'neighbor' has a far wider application than it has with us.

Finally, since it is not always enough to remind man of God, the Indians have bethought them to remind God of man, who, indeed, sometimes seems to forget him. Consequently, pious persons hammer gongs of sonorous metal to remind the universal giver that there are men under the sky, and that it is well to take an interest in their affairs. To guarantee the success of their plea, old women timidly approach a glass box in which they have the satisfaction of seeing their modest penny join the pennies of others, which will be used for some good works, greatly profiting the giver.

A profusion of electric lights allows the pious festival to continue day and night. There is only one accident that could interrupt it; the great powder magazine that the English have set up at the side of the pagoda might some

day decide to explode.[1] The presence of Buddha is perhaps an insurance. May it be so! Once on a time a tiger came, uninvited. Wild with fright, the beast took refuge on the top of the edifice, where good Buddhist rifles assured him of a step forward in the series of his reincarnations. A statue of the tiger, set up to perpetuate an incident considered unworthy to constitute a miracle, still recalls the episode.

Throughout the whole of Burma colossal statues of Buddha watch over forests and rice fields. Innumerable ruined pagodas, piously abandoned to the invasion of vegetation,[2] declare the constant presence of the Master. Master? Or God? Very likely no one asks the question. Because Sakya Muni and Jesus Christ tried to be men in the highest sense of the word, they became gods in spite of themselves. It seems to me that of the two the Burmese Buddha has kept more of the human quality.[3]

Among the refinements of a primitive religious art, city and country everywhere testify to a cult for flowers — for the tree has kept the primacy of an intangible cult. Ceylon and Java perpetuate the memory of that worship with sylvan festivals, Paradenya and Buitenzorg, wherein, nevertheless, an accumulation of the most beautiful vegetation fails to equal the charm which imagination finds in the uncultivated jungle. On the 'English garden' and on the 'French garden' the opinion of the world is divided. But

[1] On pages 68–69, in chapter III, the author calls particular attention to the remark made by Darwin on his trip to the Andes: 'The pot doesn't *want* to boil the potatoes,' as illustrating the attribution of volition and sensation to inanimate objects. Could a better example be found than the author's own words: '. . . que la poudrière . . . *se décidât* à faire explosion'? (Translators' note.)

[2] At Pagan, on the Irrawaddi River, there were not less than twelve thousand pagodas. The invasion of the Tamils left twelve hundred, some of which are unusually beautiful.

[3] Nothing is more touching than the meeting of Burmese families on a pilgrimage to the famous ruins of Anuradhpura in Ceylon. The great sleeping Buddha amiably accepts from the pilgrims in gala dress the homage of a flower accompanied by a libation from the neighboring spring. The illumination of the mystic smile pervades everything. At Sarnath, where Buddha preached his first sermon, I have seen Burmese pilgrims bring leaves of gold with which to reguild the great stupa. That is the classic gesture of Burmese piety.

everywhere the garden attracts us. And one of the last interests of my life will be a garden of indeterminate shape, without corbels, without paths, without parterres and without color schemes — a garden in which will be mingled shrubs and flowers, both wild and cultivated, and which will border on the jealous ocean. It will be an exquisite return to the original, but now lost, surprises of nature.

Together with the harmonies of tree and flower, rooted in the soil but like us tossed into the adventure of life, a horde of living, acting creatures swarms over the length of our planetary domain, only to increase the cruel strife. To our domestic animals fall the rewards of slavery, ending with the butcher's knife. Kindness toward others is not instinctive. We reward the animals, our faithful servants, with blows; we overlook many unhappy victims among them; innocent birds are nailed, no one knows why, to the doors of barns; we torture them to amuse ourselves. And yet they are our close kin! Still we have made a notable improvement over slavery and cannibalism. Let Lamarck and Darwin explain our common descent. Look before you philosophize, O you who guard yourselves from the temptation to attain that knowledge of which the unknown elements so terrify you! Watch the futile partitions behind which infatuated man in his vanity tries to hide fall to the ground! Accept the drama of the earth as science reveals it and wonder at finding yourself able to adapt to it your noblest emotions in their highest form.

In the enchanting setting of Kandy — capital of Ceylon — in the Temple of the Tooth, there is a god so completely human that he loads himself down with a gorgeous accumulation of jewels. Great bowls of massive gold are supposed to represent the wooden begging-bowl of the Master — his single piece of property. The childish joy which those pious people take in handling piles of diamonds, pearls, and emeralds because they like to think of them as perfect testimonials of love, disarms criticism. Each of us is religious in his own individual way. Childish actions flow from childish thoughts.

From near by, under the blazing sky of a Cingalese night, the quick strokes of a silver bell often disturb my repose. It is the good priests of the temple, who, according to their ingenuous custom, think they should call the deity's attention to the earth. They have ample reason for so thinking. Will they ever be heard?

The fate of Buddhism, result of human evolution, was to develop according to the chance reactions of evolving man. A naked doctrine is not enough to excite the deep emotions of religious idealism. To achieve that result necessitates the birth of legends realizing the more effective inspiration of the living ideal. From that point of view, myths are surer guides than dogma itself. We can judge the truth of the statement by the elaborations of dogma that had to be laboriously drawn from the few doctrinal sayings of the Nazarene, whereas his parables ran from mouth to mouth in the newly founded churches, as they still do among us. Jainism (the result of a reform in Brahmanism that occurred before the establishment of Buddhism) supplied Buddha with the skeleton of his doctrine of a world without beginning or end, together with the theory of successive reincarnations. Acknowledging no supreme deity,[1] Jainism retained only a troop of secondary gods, thanks to whom, perhaps, it was able to escape the disaster that befell Buddhist philosophy. At Calcutta the curator who guided me around the great Jainist temple confided to me that the doctrine of Jainism had notably reduced the number of gods. 'There are now,' he said exultantly, 'only forty-four.' I felt relieved. At the marvelous temple of Mount Abu another eminent Jainist assured me that no more than twenty-three were left in all. To me that seemed ample. In the garden of the Bengalese temple I saw casts of Greek gods in company with the fanciful personages of Parisian pottery — which I considered a sign of an inclusive liberalism. Because I would not consent to take off my shoes, which testified to the murder of a living creature, I was not admitted to see

[1] A highly important school of Brahmanism in its purest form also discards the idea of a personal divinity. The Ramayana speaks of 'Brahmanic atheists.'

the innominable principle of life. My friends, who were more docile that I, were able to contemplate an indescribable object that resembled, they told me, a bit of blue glass. Jainism did not speculate about origins. Luckily, the structure of the world was left to afford matter for metaphysical discussion. Vedism, through its metempsychosis, saved Jainism and Buddhism from attempting any metaphysical theory of life.

When the day of Hellenism arrived, it dazzled the world with a crop of myths unsurpassed except by India. We are still completely saturated with the luxuriant poetry which Rome made anæmic, and of which Christianity signed the death warrant. Lucretius eventually tried to lend poetical form to his Epicurean formulæ of mingled fact and fancy, which victorious Christian mysticism soon ignored.

There are hundreds of legends about Buddha. They have been gathered into an anthology — the Jataka. There you will find the story of Buddha's giving his body to the tigress because 'her little ones were hungry.' The whole of Buddhism is contained in those simple narratives, which affirm the solidarity of all terrestrial life. Jesus was satisfied with the love of humanity. In the Jataka you will find again the legend of Magdalen. In the Buddhist version a rich courtesan invited Sakya Muni with his disciples to a repast that she wished to give in their honor. The Master had already declined other invitations. He accepted hers — to the great scandal of his disciples. He went to the feast and, as the company rose from the table, the hostess said that she had been converted by the words of the Master; that she renounced all her wealth, and that she proposed to give her garden to the brotherhood so that they might build there a monastery at her expense. Thus is proclaimed the noble condescension which Buddha showed toward all weak human creatures in order that he might lift up again those who had fallen into sin.

Greater still, perhaps, is the moral significance of the legend about the pious monk who, having come to a village to preach the Word, sat down under a tree to wait for listen-

ers. Eager to hear, men, women, and children of every condition, gathered around the holy man who was to edify them. However, a bird perched in the top of a tree and began to sing. He sang; he sang without stopping, and the good people marveled and exclaimed. Then, when the bird flew away, the preacher arose and said: 'The sermon has been preached.' And each one felt that, indeed, there could be no better preaching, for it had been given him to hear something better than the words of a human interpreter of nature; nature itself had spoken, expressing itself with infinite sweetness. The song had contained every gradation of charm! What greater blessing than the unutterable harmony in which man slakes his thirst, and from which he absorbs the emanations of a beauty for which there are no words! All the pageant of unrealized hopes, a gleam of the life that is higher than life, a dream of enchantment come true! The arid precision of deceptive words had too often disappointed suffering mankind. Happy is the emotion of song!

I do not know why I so boldly try to sum up in a few words the aspects and the development of Hindu thought. The subject fascinates me and leads me on.[1] From every point of view it is glaringly apparent that the obscurity of the evidence and the profusion of commentaries make any strictly logical arrangement of coördinate ideas almost impossible. We should be grateful that even the lines of an hypothesis can be pieced together. It remains to be shown how, through the progressive upbuilding of a universal pantheism which from the point of view of positive science remains the highest conception of our metaphysics, the innumerable postulates of the Divinity were arranged, superimposed, and blended in the Hindu soul. I should soon be lost in such a subject.

Quite obviously this higher metaphysics could not satisfy the masses. Their simple needs required that they should familiarize themselves with the action of a universe

[1] I recommend to the reader the extensive study of René Grousset, *Histoire de l'Asie.*

that they were yet incapable of defining, since above all they craved rites of religious intercession that would raise them to the level of interlocutors with the Powers of the Universe. From that desire there inevitably sprang up priestly organizations — which Greece so successfully avoided — for maintaining formulæ supposed to embody definitions (beyond the power of words to express) of the indefinable. About the eighth century before our era Vedic pantheism, though never effaced, was much weakened through the advance of Brahmanism. Later, Brahmanism was overwhelmed by Buddhism, which was a pantheistic reaction. Finally, Buddhism was swept away by a last counter-offensive of the Brahmins.

The period of Asoka was wonderfully brilliant. However, he deemed it wise from time to time to address to the monks and nuns a communication recalling them to regularity — a call which he felt they needed. Incredibly tolerant, India saw the Buddhists attack the Brahmins in their monasteries in anticipation of the day when the Buddhist 'viharas' should in their turn be emptied of their monks by Brahministic violence. As always happens, blood was abundantly spilled in the name of the peace of souls.

Like the Brahmins, Buddha preached deliverance from life, but, instead of seeking that supreme benefit in absorption into the bosom of the Universal Being, he proposed to win it by ridding himself of all interest in the circumstances of life through entering into Nirvana. The intellectual leaders followed him; the populace, attached to its traditional gods, reproached him on the ground that his doctrine would end in the extinction of the family through the disappearance of children — probably a fair criticism. When friends came to tell Sakya Muni, who was about to begin his great pilgrimage, that a son had been born to him and to ask what name should be given to the child, he replied: 'Call him the Hindrance.'

Contrast with sentiments that are so remote from our own this fine expression of universal pity: 'More tears have been shed than there is water in the great sea.' Jesus of

Nazareth knew no such revolts; they would have seemed to him criminal offenses against the Merciful Father. Sakya Muni extended his signal charity even to the humblest animals. 'In the forest I was a young hare. I fed on herbs, plants, leaves, and fruit. A monkey, a jackal, a young otter, and I lived together, and I did no harm to any living creature.' No such saying ever fell from the lips of Christ.[1]

Asoka, who recommended being 'kind to living creatures,' is an example of the most remarkable tolerance. He suppressed the almost divine honors that were paid to the Brahmins, but nevertheless continued to extend to them his charity and, at need, his protection. He increased the number of their hospitals and of their houses of refuge.

After the Bactrian colonization carried out by the successors of Alexander, the Græco-Indian Menander continued the work of Asoka and of his missions in Egypt, in Syria, and in Greece. Their activities were consolidated through the solicitude of the famous Buddhist prince, Kanishka. However, exhausted with its many victories, Buddhism saw the Brahmins regain the upper hand. The name of Buddha was engraved on coins — an unexpected honor for the divine mendicant. Followed councils for the purpose of establishing the doctrine, which had suffered from the ravages of time. Compare the words of Jesus at the beginning of historic Christianity with what the Christians of our day have made of them.

Springing from the same emotional base, there developed two opposing formularies of Buddhist faith: the Great Method (Mahayana) of the North, the orthodoxy of which was established by the Council of Peshawar after it had revised the ancient canons, and the Little Method (Hinayana) in which the South entrenched itself, with Mathura as its religious capital.

[1] Mahavira, the founder of Jainism, was almost a contemporary of Sakya Muni. There are many points of resemblance between the doctrines of the two — notably, respect for animal life. Jainism remained Indian. Buddhism aspired to conquer the human race, and, nominally, has conquered it, since it still ranks as the religion of the majority.

From that time China, whose boundaries touched those of India, began to welcome the teachings of Buddha. But, as extended, the doctrine was no longer in agreement with the pure idealism which inspired the great preacher. In the fourteenth and sixteenth centuries of our era the need which had already begun to be felt of a purified Buddhism led the Chinese pilgrims Fa Hien and Hiouen Thsang into India, in search of the living springs.

We know that the Hellenistic art of Gandhara was the beginning of Buddhist iconography.[1] In the frescoes of Ajanta (A.D. sixth century), which are one of the most curious monuments of history, Greek influence is quite as obvious. What would the grave Sakya Muni have thought of those dazzling manifestations of art? They were so foreign to his spirit that long after his death it was still forbidden to make either picture or statue of him.

After all, as Grousset remarks, religious iconography is merely the sign of internal change, and it was an internal change that made of the austere philosophy of Buddha an organized cult with metaphysical dogmas, a subtle mysticism, miracles, a paradise, a hell, and a complete hierarchy of saints and divinities. That was the school of the Great Method which, at the beginning, was dominant in Gandhara and in Kashmir.

The Little Method, of which Ceylon was the depository, sought to preserve in Buddhism the character derived from the founder. The doctrine of the Little Method was nevertheless far from pure, since in it the unfortunate Sakya Muni was transformed from a simple monk into a divinity. Thus, through the ebb and flow of united misconception, are religions set up, composed, and decomposed.

After the fourth century Buddhism ceased to make progress in India. In the fifth century the Chinese Fa Hien saw the Brahmins roughly expel the Buddhist monks from their monasteries. Blood was shed — religiously. For a long time Buddhist missions had regularly marched to the conquest of China. Caravans of monks, fleeing before the

[1] See the admirable works of Alfred Foucher.

Huns, had sought in the Far East, not only a place of refuge, but a field for proselytizing. As the frescoes of Eastern Turkestan, reminiscent of those of Ajanta, and as the ubiquitous sculptures bear witness, they carried with them Græco-Buddhistic art.

In the revulsion of feeling that comes on reaching home, the peregrinations of Hiouen Thsang across the Indian mainland were for that Buddhist monk a succession of enchantments. But the end of a great dream was already near, at least within the domain of continental India. The stirrings of an immense pity ended in a sterile apotheosis by the easy process of deification. The triumphs and the defeats of man are united in a certain rhythm. Islam was to reconcile conquerors and conquered in common defeat. Buddhism had had its great day in the history of thought. Piously embalmed in Ceylon, it retains all its youthful beauty in Burma; and in China and in Japan the name, if not the thought, of Sakya Muni enjoys the indefinable prestige of any evocation of the superhuman.

The dazzling splendor of Burubudur still bears witness to the ancient flowering of Buddhism in Java. A visit to it and to the temple at Rangoon are of all pilgrimages the ones that I most heartily recommend. Burubudur is an edifice beside which the most beautiful buildings of India seem insignificant. It is not a temple in the sense in which we understand the word, for, strictly speaking, no Buddhist worship took place there. Terraces rise one above another, where processions roll by between lines of bas-reliefs that depict all the legends of the life of Buddha. Bodhisattvas guard each flight of stairs, while they await the day when they too shall become Buddhas. High above all is a Buddha that was left unfinished because Buddha was perfect, and no attempt to model him could attain perfection.

The general aspect of the edifice may be described as a triumphant flight of beautiful stone. And, as the wooded hill on the horizon, in spite of its inequalities, gives the impression of an uninterrupted curve, so the infinite fusing of all the skillfully cut steps leaves the sense of the great

breast of Mother Earth,[1] offered to the avid lips of our humanity. Gothic art obviously made a mistake when it sought height in order to draw nearer to the Almighty.[2] That was the idea which embodied the puerile purpose of the Tower of Babel, where man saw himself far from earth, yet came no nearer to the infinite. The Mosque, with the great air-bubble in which it encloses us, has always impressed me with the sense of my smallness more than have our Cathedrals. Burubudur may be likened to a volcanic upheaval of earthly powers toward the infinite. It is the temple of strength,[3] whereas the abrupt termination of massive Gothic towers expresses above all an inability to go on.

But we must complete the cycle of Indian speculation.

I cannot set forth here the doctrine, or the doctrines, of the Vedanta. That doctrine is nothing less than a knowledge of the Vedanta, according to the traditional interpretation of the Upanishads and of the Vedanta Soutras. Revelation or tradition — much fault has been found with the words, for when we go back to the origin of the two ideas they express, they become almost confounded in sense.

Under the title: 'Introduction to Vedantic Philosophy,' Max Müller has given us an excellent exposition of the subject in three lectures. Any one will profit by reading them. The chief danger lies in the fact that the eminent philologist is determined to find his personal god in the books of India. Now, the divinity of those books seems closely to resemble that of Spinoza, an eminent Asiatic, who instinctively re-

[1] More than a hundred meters square.

[2] The problem was quite different, since Gothic art was concerned with sheltering people in the edifice, which originally had been only the House of God, and which was not then used by the people, since the sacrifice was offered out of doors. That practice required enlargement of the enclosure rather than height in the edifice. Scripture tells us that in order to be nearer their god our simple forefathers ascended the heights to offer sacrifice. One such open-air altar can still be seen at Athens — an altar to Zeus that he gave over to the orators of the Pnyx.

[3] The Dutch Government has published a beautifully illustrated monograph on Burubudur.

lived the thought of India, just as, according to the legend, Pascal automatically re-lived the thoughts of Euclid.

It is conceded that the Vedanta of Sankara is more deistic than the Sankya of Kapila, which is not deistic at all. But for the Hindu mind what a prism of imperceptible shades lies between the two conceptions.

Moreover, the thoughts are translated by terms, the sense of which, when transferred from one language to another, cannot be duplicated. The actual sense has varied with the ages, and we cannot always know what the precise significance is to-day, or what it was yesterday. The shades of Indian thought are too often elusive — the excess of precision seeming rather to be regarded as an additional opportunity for error.[1] Sankara, with his precious commentaries, is an excellent guide. But whatever his sources may have been, he lived in the eighth century after Christ, that is, far from the origins, and sometimes we detect him in error. The discussion is by no means closed.

With the Vedanta of Sankara and the Sankya of Kapila, India has kept the advantage of having the loftiest metaphysics, which some day, perhaps, will be recognized as having anticipated the conclusions of knowledge based on universally admitted science.

Some persons say that the Sankya is atheistic. Others regard it rather as being pantheistic like the Vedanta itself. No author seems to me to sum up the philosophy of the Sankya according to Kapila, the original inspirer of Buddhism, better than Bunsen in the following passage:[2]

'Nature is without consciousness and without knowledge; it has no personal object; it merely serves mind without knowing what it serves. All creation, however, rests on the combination of mind and nature and on the coöperation between them. The end of life and of every activity of creation is the perfecting of mind; it is a liberation from

[1] The Pundits with whom I talked at the courts of Rajahs seemed to me to be insufferable chatterers — orators rather than scholars. Moreover, they generally ended their talk with these words: 'In your own country you have Sénard, who knows much more about the subject than we do.'

[2] *God in History.*

nature through the agency of the mind. Mind is present as a witness throughout the whole life of nature. Its action is merely apparent; its instinct is to enjoy nature and then to recognize its nullity. The sentiment of its nullity is the one true sentiment; it leads to release. Thanks to it, the reasoning faculties succeed in taking command. When the nullity of nature is recognized, the object of life is attained.'

Bunsen insists that Nirvana — extinction — simply means 'the peace of the soul.' He thus fabricates a deistic Buddhism that fits his own doctrine, but that puts him into direct contradiction with Burnouf, of whom, I must admit, he does not get the better. I shall borrow from the great commentator on Buddhism and its origins only his conclusion, which is explicit:

'In ontology the atheistic doctrines of the Sankya are the absence of any god and the multiplicity and eternity of human souls; in physics they are the existence of an eternal nature, endowed with properties, self-transforming and possessing the elements of the forms with which the human soul in its journey through the world is clothed. From that teaching Sakya Muni took the idea that there is no god, and also the theory of the multiplicity of human souls, that of transmigration, and that of Nirvana, or deliverance, which was, in general, a tenet of every Brahmanic school. But it is not easy to-day to conceive what he meant by Nirvana, for he nowhere defines it. However, as he never mentions any god, Nirvana cannot be for him the absorption of the individual soul into the bosom of a universal divinity — as the orthodox Brahmins believed. The word emptiness, which even then appeared on all the monuments that are clearly the most ancient, leads me to think that Sakya Muni saw the supreme god in the complete destruction of the thinking principle. As a simile that he often repeats would make one suppose, he pictured it to himself as the exhaustion of the light in a lamp that is going out.' [1]

As we know, Burnouf worked principally on the Nepalean and Thibetan writings. If any one has the curiosity to

[1] Burnouf, *Introduction à l'histoire du Bouddhisme.*

investigate the four great schools of Buddhist metaphysics at Nepal, he will consult their writings with benefit no doubt, but only by sustained effort, for the matter exhausts every refinement of the extreme subtlety of Asiatic thought. What struck me most in the remarkable extracts quoted by Burnouf is the Socratic turn of the argumentative dialogue, and the tenuous fragility of concepts unknown to Buddha. Plato, who, I know not how, received a part of that legacy, was delighted with it. There again was a strange meeting of minds.

Like a stroller rummaging about in high vegetation, I am bent on plucking the flowering tops. The cluster which I am trying to pick does not require any didactic coördination. Comparisons among states of mind, taken in the order in which mental evolution produced them, are enough. Through Vedism and its metaphysics, as well as through Buddhism and its conception of the Cosmos, India enables us to go back to the sources of our dreams, and through them, to the origins of the thoughts that followed them. I must content myself here with brief outlines. If the first hints of science and of generalization about the earth and about mankind really came to us from Chaldea, and perhaps also from Egypt, it was incontestably India that knew how to bind the luminous sheaves of investigation into radiant torches of dreams — lures to generalization under the spell of which we still remain. In spite of all the systematic training which ontology has given us, the marvelous suppleness of the Indian mind has never been excelled.

THE FAR EAST

All the cosmogonies, as I have said, derive from the solar cult, expressed in the Bible and in the sacred books of India through the deification of abstract universal power, personified under different names. The same phenomena occurred everywhere in forms that varied according to the stage of mental evolution at which minds found themselves when the various Scriptures were recorded.

A rapid glance at China, which has such a special mental-

ity, will not be without interest. If, instead of evolution of energy governed by universal coördinating law, there were such a thing as *design* in the world, we might believe that thinking China was expressly formed to afford us a counter-proof by which to test our own mental processes. Let us limit our efforts to trying to grasp states of mind so different from our own.

The first fact that we encounter is the surviving worship — surviving at least in words — of the luminous star and its train. Yesterday the Emperor of China was still the 'Son of Heaven'; the Mikado is always the direct descendant of the Goddess of the Sun. The inference that the East had a solar cosmogony cannot be seriously disputed. It must, therefore, be admitted that China from the day of its origin surrendered itself to those primitive explanations of the universe which in the beginning prevailed everywhere.

From the most remote ages, the profound difference between the mental character of the Far East and our own has been especially manifested in the successive emotional states that followed the first thrill of god-making. Although, both among the great and among the little peoples of history, we have seen emotion awakened by the dawn of thought continue in the form of strong hereditary habit and thus dominate our social and individual activities, yet the Chinese mind, ever seeking perfect balance and passionately attached to the most delicate subtleties of poetry, has never allowed itself to be dazzled by the 'miraculous' sky, by its stars or by contact with the infinite. It looked the fountain of light straight in the face, and, without troubling itself overmuch about the logical consequences, deified it with charming grace. It is probable that not one of our dreams is strange to it. The difference is that the people, 'chosen of heaven,' shut deep within the crust of its original thought, and profoundly attached to the empirical regulation wherein it finds the ritual protection of its life, yet remains floating and unattached amid the mental undulations and uncertainties of Asiatic thought.

The subsequent temptation to become lost in the inex-

tricable tangle of the development of the myths does not seem to have presented itself to the original exigencies of Chinese analysis. A broadened Buddhism was ingenuously superimposed on ancient idolatries which still lived in verbal forms. It was as if the Chinese pantheon had been embalmed. The same thing happened in Japan, where gods and goddesses easily became Buddhist in a popular union of religious observances. With all the grace of the finest courtesy, every rite was practiced in their honor. The sky (Shang Ti) certainly deserved homage. But when an elementary rationalism began to appear, it did not raise the question whether the immense blue vault should be abandoned to the conflicts between scientific knowledge and theological interpretation, even though metaphysically wedded. Still less was there question of persecuting any one. We Christians would have burned Lao Tsze and Confucius with all the appropriate ceremonies. In China they were, and remain, deified. Perhaps these two procedures, both prompted by an admiration in which there was an element of fear, are not so different as might be supposed.

Necessarily there were Chinese cosmogonies. China, far from clinging to the original great formulæ commonly found in the history of religions, has lost them. No one talks of them. Tradition, which is so strong in that land, breaks down at this point. And when the question of the constituents of the world presented itself, it was — before the formal consignment of oral tradition to the classic ideograms — merely symbolized by differently arranged lines.[1] The symbol, we are told, dates from almost three thousand years before Christ.

The first Chinese conception of the universe was necessarily theological. But six hundred years before Christ, Confucius and Mencius, the true leaders of Chinese thought, were rationalists whose fixed determination was

[1] Groups of three variously broken or continuous lines represent the three Powers — the heavens, the earth, and man — and act as depositories of doctrine. We often see them on the porcelain displayed in our shops. The figures are known as the *Kua*.

to put aside the contradictions of the theological point of view, and who even refused to consider them at all. The same is true of Chucius. The philosophy of Tao [1] limits itself to mentioning the Great Extreme (the 'Heaven' of tradition), the intervention of which in human affairs Chucius does not admit. We should class Lao Tsze, who is the prophet of the Tao philosophy, as a mystic. He follows the same paths as Sakya Muni, to whom he is often compared. Indeed, of the two, his saintliness, his disdain of the world, his contempt of public opinion, and his silent detachment from all things make him the fitter for consecration.

As in the case of his Indian contemporary, Lao Tsze, who, like Buddha, was the prophet of a doctrine of the universe that included no god, and that lacked any definite cult, could not escape legendary lore. 'I have seen Lao Tsze,' said Confucius, 'and I know him as little as I know the Dragon.' How could the two men have understood each other? One sought solitude in order to consecrate his life to meditation according to the intuitive method; the other tried to gather around him a select public that should obtain for man a life of justice and happiness by teaching and practicing rules of good conduct.

We have vague traditions, some of which may not be without foundation, that indicate a relation between Lao Tsze and Jewish thought, Orphism, Greece, and India. The truth is that the Chinese philosopher is more closely akin to the mysticism and metaphysics of India than is any other thinker of the Far East. Some people have even thought he should be ranked with Socrates — the metaphysical thinker who disdained Olympus, and who was to be born when the Chinese died.

The philosophy of the Far East, through its ONE — identified with the universe — into which the emanation

[1] The 'Tao' is the 'Way,' the 'Direction,' a philosophic conception of universal movement more profound than all the personified abstractions of our cults. The same idea of a path — an idea that implies evolution — is also found in the Japanese 'Shinto' which, like the Chinese 'Tao,' includes the cult of the hearth.

'man' is eventually resolved, is, like the pantheism of India, so nearly incomprehensible that for the average man there remains no other refuge than the rationalistic empiricism of Confucius. Lao Tsze perceives the defect so clearly that he desperately seeks the sign-post which points the way to 'the Supreme Reason,' though he is unable to find anything but a word quite empty of meaning. Thus it happens that, like Buddha himself, who recognized no God, the thinker of the Far East ends by traveling the same path of completely dry rationalism along which his rival had preceded him. The idea of living as a 'solitary' in order to rise above humanity, that is, to live human thought apart from the shocks between experience and reason by which living humanity is formed, is a contradiction which originated in India, and with which our Christian hermits vainly struggled.

The cosmogony of Chucius, which lacks all poetic inspiration, and which is without a trace of elementary myth, is naturalistic in its ideology. Its point of departure is the recognition of 'a natural law of things' (Li), and of a 'vital essence.' It declines to discuss the hypothesis of a 'creator.' To it the Li and the Ki — to-day we should call them matter and energy — seemed adequately to account for everything. I do not mean that the terms 'Li' and 'Ki' have a meaning identical with that of our own terms; they none the less express the same intellectual view, which is the final result of our highest analytical effort. The fact should not astonish us, for in total contrast with other peoples the elders of the Chinese whose cosmogonies developed late and were, furthermore, very vague, wisely contented themselves with reasoning about the universe as an established fact.[1]

If the origin of the Ki and the Li lies in the Great Extreme — the Universal Being, the Atman of India, from whom Brahma himself emanated — everything that flows

[1] The symbols of the Tai Ki (Great Extreme) which, to the Chinese, represent the supreme formula of the universe, have been described in the chapter on Symbols (q. v.).

from them is the effect of perpetual revolution, which carries us back again to the motion of a wheel, and which the Chinese express through a symbolic circle in the two halves of which are the familiar curved figures of the Yang and the Yin, a male and a female embryo in course of growth. That later on we should find that they had become popularized has no historical importance, because the populace is always curious about tales concerning the origin of the first man. The syncretism of Heaven (Shang Ti) — materialization of the Universal Being — and the agnosticism of the school of the Tao tried to unite again amid the mazes of the original generalizations.

By means of the Li and the Ki, Chucius does not hesitate to conceive the world and man himself as our present pantheists conceive them. As a matter of fact, Chucius pays scant attention to the origin and to the future of man. In his philosophy, as elsewhere, the notions of a beginning and an end encounter the blank wall against which beats the Chinese mind, which, not knowing, does not try to know. So far as we can understand, death, according to Confucius, Lao Tsze, and Chucius, seems to imply nothing other than that great 'return' — the notion of which India carried to the point of making Brahma himself reënter the eternal cycle of the elements from which he sprang.

Is the fact that the Tao does not try to penetrate the origin of the world a sign of weakness or of wisdom? The reader may decide. If our forbears had happened to understand that their imaginative affirmations could be only provisional, since they necessarily had to change as our mental capacity increased, our race would have escaped very painful misunderstandings. But how could they be expected to sacrifice the chances of a divine dream to the doubtful hope of an unknown development? If the Chinese, like the Indian, had been tempted to doubt, I believe that he would have turned aside from audacities of thought that to him would have seemed immaterial.

China paid what it deemed a sufficient tribute to the temptations to lofty flights in its Heaven (Great Extreme),

which closely resembled our infinite. But, far from attaching its soul to its old familiar gods, it poetically retained them in order to preserve the traditions of its worship under the philosophical law of Buddha. Thus it could offer only a passive resistance to foreign gods,[1] and will be able to do no more against the coördinate scientific knowledge that sooner or later will in turn besiege it.

An outstanding characteristic of the Chinese people is its immoderate respect for tradition. Although China is the remotest ancestor of all civilizations, necessarily superstitious through lack of knowledge, attached above all to forms that it deems outweigh the substance,[2] timid to the point of stopping short on the way to the scientific know-

[1] Except for spasms of popular rage not comparable to the systematic ferocities of our own history.

[2] The welcome given to strangers in the Chinese temples is characterized by friendly courtesy. Our churches — to which the faithful more often turn for solace in their troubles than to offer thanks — convey an impression rather of sadness and resignation. A silence falls from above. With half-closed eyes and bowed head each person slips discreetly to his seat. A sacristan passes — pompously. An old priest goes to his duties with the air of a man who has formed a partnership with eternity. In the Chinese temples I saw only smiling good nature and childlike simplicity. Every one is benevolently anxious to show courtesy to any one who wishes to visit the divine personages. The monsters themselves, with their set grimaces are, you feel, good fellows. The temple, with its decorations and with its images, is a drawing-room, and in a drawing-room usage decrees that faces shall show an appropriate graciousness. A drawing-room open to the public, however, cannot escape some liberties. I once saw two pretty ladies in rustling silks and gold jewelry, struggling with a fretful and cantankerous child. When he had recovered his good behavior, the floor showed that he had forgotten himself. The lookers-on smiled and the good Buddha himself seemed amused. In the temple gardens sacred turtles, divinities of a time before Buddha, swim about with questioning eyes just above the surface of the little lake in which they live. It is proper to throw them a handful of rice. At Penang, in Burma, a Chinese temple shelters innumerable snakes that in full liberty coil around vases filled with flowers or around the sacred ornaments. They are everywhere. Some of them, rigid with indifference, are almost invisible among the decorations. Others coil themselves or creep about without being astonished at our astonishment. They came from China, it seems, no one knows how. They have no desire to escape. Fine fresh eggs — for the Chinese alone prefer their eggs 'old' — lying in the water of a bronze vase, are their delicacies. When a snake has sucked one, the shell rises to the surface, and the keeper hastens to substitute another. They lead the life of gods, nourished with offerings and happy in an appropriate inactivity.

ledge which it had so brilliantly started,[1] proud of its Middle Empire, the Navel of the Universe, and through that pride almost crystallizing in self-admiration, we have, nevertheless, seen it push abnegation of its own thought to the point of importing Indian Buddhism merely because the doctrine seemed more beautiful, that is, more satisfying to its emotions, than its own.[2]

I wish I could describe the great pilgrimages which the famous Chinese Buddhists, Fa Hien and Hiouen Thsang, made to India in the fourth and sixth centuries of our era in quest of the Canon of Buddha. In comparison, the lofty propaganda of Saint Paul among the Gentiles was mere sport. Undertaken from a motive exactly opposite to that which animated the Christian apostle, the mission of the two Chinese pilgrims was not to spread their own beliefs, but to be sure they had them in their pure form. They sought to purify at the source every bit of testimony relating to the authentic deeds and words of Buddha Sakya Muni.

Their plan had such moral elevation that nothing in the history of religion can, I believe, be compared with it; for among manifestations of the religious spirit the desire on the part of any one to free the sacred texts from error before devoting himself to preaching them, is rare. Moreover, emotion had to be raised to the pitch fit to evoke the unconquerable energy that during fifteen years was to endure incredible fatigues, pass through the most perilous encounters, and without a moment of weakness endure a sum

[1] Did not the very people who invented the compass undertake one fine morning, as a matter of doctrine, to destroy the railways?

[2] If our Christian effort has been powerless to make headway against Chinese rationalism, with or without Buddha, just as it has been powerless against Islam, the reason is that our propaganda is certainly presented in a bad light. We are so accustomed to our dogmas that we do not realize traits in them which greatly shock minds accustomed to ways of thought far removed from our own. For many the virgin birth and theophagy are insuperable obstacles. In India, where mythology has accomplished greater miracles than the ones just mentioned, our missionaries have made some conquests among the imaginative people of the South, but five minutes' talk will convince any one of the quality of those 'conversions.'

of material and moral trials such as to this day history has perhaps never inflicted on human creatures.

The most famous conquerors whose statues encumber our public squares with the tale of their wars have usually aimed to seize expanses of country by dint of killing, never asking themselves what they could do with them and for the most part finding themselves incapable of profiting from them. We have seen whole peoples, mad with savage enthusiasm, plunge into the joy of pillage, murder, and destruction, irrespective of any definite purpose. Such was the madness that drove Alexander to India until his soldiers, weary of always advancing without any apparent purpose, at last rebelled. All that the Macedonian could do was to set up no one knows what shapeless monument to mark the end of an enterprise without object, without result, without cause or pretext. The stones of the monument have vanished, leaving only an empty echo in history, whereas all manner of writers work feverishly to perpetuate the memory of an act of the plainest folly, seeking to reconcile it with reason.

Centuries had elapsed since Sakya Muni, when the pious 'intellectual' Fa Hien and the mendicant friar Hiouen Thsang were moved by an irresistible desire to perfect themselves in the ways of ideal truth, and, without dreaming of doing anything of the kind, made a place for themselves in history by their complete self-abnegation. I salute them in passing, too happy if I can make a few people appreciate the beauty of their example.

The pilgrim Fa Hien, who began his journey in the first days of the fourth century of the Christian era, was followed a century later, by the monk Hiouen Thsang, trusting in the virtue of that begging bowl which we later see — bitter irony! — reproduced in solid gold in the Temple of the Tooth of Buddha at Kandy. They went to seek the truth about themselves, about their faith, about its foundations, and its effect on human solidarity. So far were they from wanting to massacre the heretic that to the honor of all concerned, later you shall see them ingenuously claim and receive his aid in the service of Buddha.

Several centuries earlier, Buddhism, solely through the enthusiasm of its propaganda, had traveled from India into China and had established its mild rule over the vague ruins of worn-out gods. The Christianity of Saint Paul in its moral conquest of pagans was peaceful, but soon became militant through its attempt to gain political power, which had broken down simultaneously with the fall of the Hellenistic polytheism of the Roman Empire. The thought of the Chinese, whose gods were superlatively symbols of cosmic powers, was wholly different. The same is true of India; the two Asiatic minds meet in a disposition toward a general tolerance unknown to our narrow sympathies.

Buddhism overflowed into China through its own inherent strength. In spite of the obstacle of distance,[1] a continual exchange of sentiment and of thought was established between China and India. I do not deny that railways and the telegraph, whether wireless or not, are marvelous instruments of communication. Yet how much more marvelous is the irresistible desire of the idealist to disseminate what is best in himself and to receive in return as a fair equivalent the highest realization of an ideal to which he is wholly consecrated! That the ideal was realized is obvious in the spontaneous spread of popular Buddhism (which quickly degenerated after the glorious period of Asoka) through the immense territory where the great leaders, Lao Tsze and Confucius did not enforce religious dogmatism, and the national gods of which exacted little beyond a courteous gesture.

The ultimate revenge of Brahmanism on the dying Buddhism of India and the consequent disorders — not to speak of the invasion of the Huns — brought about the emigration *en masse* of persecuted monks at the very time when, perhaps, in the persons of certain bold spirits, the native emotionalism of China was already making its way toward that mysterious Punjab where the sun of Buddhism had risen. For the chances are that in their utter simplicity Fa

[1] It should be borne in mind, nevertheless, that there was a time when only the Oxus separated China from India.

Hien and Hiouen Thsang, could not have entered upon those fearful passes of the unknown without the aid of previous hints about the successive studies they should undertake in the course of their religious investigation — the most extensive that the world had ever attempted.

Of that inquiry itself I can give not even the briefest outline. The reader should resort to the original texts. He will see that the worthy Fa Hien on his quest for the books of the Buddhist Canon — the Great and the Little Method, and the Medium also, it would seem — was seeking not only the ancient writings, but images [1] of the Buddhist gods. For, indeed, the unfortunate Buddha, who was without a god, had become — as Christ later became — himself a divinity and was accompanied in China as well as in India by a train of vanquished gods, at the head of which marched Brahma. Degenerating Buddhism even had a verbal trinity — the 'spiritual body' of Buddha, 'the happiness of that body' which was the recompense of his virtue, and finally 'the flesh' itself in which Buddha had appeared on earth.[2]

The Chinese mind, instinctively shocked by so many variations, wanted to resolve its doubts; but its spirit was one of universal tolerance and of supreme conciliation. Did not Fa Hien on the two occasions when, returning by sea, he was in peril of shipwreck, cheerfully throw overboard his poor belongings — a jug and a bowl — but refuse to give up the books and the images which he was determined should perish only with himself? And if a finishing touch is needed to perfect the sketch of a state of mind so different from our own, consider well this fearless man who when the tempest was at its worst, regarded it as quite simple and natural to ask his fellow passengers — adherents of Chinese divinities and even of the Christian God — to place his Buddhist writings under the direct protection of '*their* awful power.'

[1] The time had already gone by when the faithful would not tolerate the 'abomination' of an image of Buddha.

[2] The man who devised such a partition must truly have had a mania for dividing things into three.

And far indeed from refusing the request — the day of the Inquisition was still distant — all those excellent men, under the influence of their common respect for their contradictory doctrines, hastened in the common danger to unite in prayer to their different gods.

The pilgrimage of Fa Hien can be summed up in a few words. In the course of fifteen years the intrepid traveler journeyed from central China, across the Gobi Desert, through the highest passes of the Hindu Kush mountains, which are so hard to cross even now, and thence to the mouth of the Ganges River. He returned by sea — after a visit to Ceylon — across the Malay straits and up the coast of Siam and of China to his starting-point. What traveler of to-day, rambling over countries for mere pleasure without pausing to understand them, even though helped by Cook's organization, would not be proud of such an achievement?

Our contemporaries are still apt to pass by without seeing;[1] Fa Hien, for the love of truth, made a prodigious effort in his investigation, besides a most arduous study of languages to fit him for the laborious task of translation. At the beginning of his Memoirs the pious pilgrim briefly sums up the origin of his enterprise: 'Distressed at the imperfection of Buddhist doctrine,' he and four of his friends agreed to travel into India and find out the Law. Accordingly, one night he abandoned his wife forever, whom he left sleeping with her hand on the head of their child, and started on horseback, followed by a groom. He was poor. With no other aid than a hope that nothing could discourage, he went forth into the wide world to win the treasure of treasures — the ideal of knowledge. Though to us the enterprise seems impossible, to him it seemed simple. He never boasts. His smiling faith willingly met all danger from man and from the elements with the unchanging serenity of a soul sure of itself and for that reason always ready to trust the event.

[1] 'I am going to Rome,' a young Englishman once said to Miss Martineau, 'not that I intend to stop there, but merely so that I can say that I have been there.' 'Why not say so now?' she answered.

In that age human nature showed a different face from what it shows to-day. Although violence and generosity were often juxtaposed, the value of life was not measured in the same scales as now. The deeper qualities of human character were perhaps not so different from what they are to-day as they may seem. The same virtues and the same vices were present, though in a different setting. The constant peril to life demanded the counterpoise of a sure asylum in the home. The finest thing in those ages, even in the most barbarous countries, was and still is, the display of a comprehensive hospitality. Every one who has visited the Orient pays tribute to the welcome that a stranger meets everywhere. The pilgrim, with or without a begging bowl, is twice welcome, for the act of faith of which he is the living testimony speaks loudly to those simple men, among whom faith reveals itself through qualities of soul, the flower of which seems lost to-day. Railway stations, turnstiles — regulations of every sort — are to-day the things that busy our minds, together with the hotel, if we can pay. In those days strangers knocked at the door, and the only payment asked consisted of friendly words. The beggar and the pilgrim of whatever faith were sacred. To-day our door is closed against them, and our hirelings perform our unavoidable duties toward our neighbor. Individual merit is replaced by an organized commerce in virtue which employs the trick of drawing a draft on Divinity. Selfishness is cloaked under the universal pretense of charitable intentions.

In the outside world violence, less completely disguised than to-day, ruled. Miracles happened everywhere. Simple-minded persons told of them whenever they met together. Pilgrims lived among prodigies witnessed by themselves or by others. Monsters, dragons, demons, besieged them at every moment, and yet they felt no dismay. A smile, a word of faith, set everything right. Even demoniac temptations were offered to pilgrims to defeat the victory of the holy word. In those days there existed men the like of whom is no more.

In the next century Hiouen Thsang, a humble Buddhist

monk, armed with his begging bowl, re-lived during sixteen years the same adventures of the same pilgrimage for the sake of obtaining an even higher enlightenment. Compared with Fa Hien, the impassive Hiouen Thsang is a veritable figure of fiction. I resist the temptation to recount his marvelous adventures, over which Max Müller lingered to pay his tribute of admiration. An excellent narrative of the high exploits of Hiouen Thsang, with an abundance of valuable notes, was lately published in London. Waters' text, full of erudition, undoubtedly tells us everything that we shall ever know of the astonishing events of that prodigious story.

Like Fa Hien, Hiouen Thsang was tempted to make a studious pilgrimage to the Sacred Land, but although the researches in which his monastic life had been spent had prepared him well for the task, he was refused leave of absence by the emperor for a journey to the Holy Places. With heroic courage he disregarded the refusal, and through a succession of incredible adventures escaped the pursuit of the civil and military officials, who had orders to take his life. In the end the great Chinese settled in the center of the Buddhist land, where the innumerable legends of Sakya Muni had everywhere left traces of varying authenticity. He gave himself up unreservedly to his consuming ardor intimately to know the thought of the Master, and his enterprise was crowned with success beyond all expectation. He returned loaded with precious booty [1] — books to translate and every kind of information that had value as testimony. Even to-day the Chinese remember the triumphal welcome offered to the glorious mendicant with

[1] We are told of 657 sacred books, resplendent images and statues of Buddha and of saints, and also of 150 authentic relics of Buddha himself. Twenty horses laden with the treasure defiled amid music and banners to the acclamations of the emperor and of his subjects.

Buddhism, after the death of the Master, became attached to the veneration of relics. At Mandalay, the ancient capital of Burma, I held in my hands authentic remains of Sakya Muni, which my eminent compatriot, Alfred Foucher, discovered in a stupa in the Punjab, through information given him by pilgrims. Minute fragments of bone and a little white dust, were enclosed in a crystal flask with a gold cover. Fortunately, Buddha left more important traces of his life.

one accord by the Emperor Tai Tong — equally renowned for his virtues and for his crimes — and by his subjects, astonished at such achievements.

Fa Hien does not tell us whether on his return he found any trace of his wife and child. I greatly fear that the matter seemed to him of no importance. Quite simply he devoted himself to writing his commentaries. The Emperor pardoned the much fêted Hiouen Thsang his disobedience and, moreover, offered him first the post of general-in-chief, and then that of prime minister — offices which he modestly declined. All he would accept was a small village cottage where in solitude he gave himself up to the work of his translations. More expansive than Fa Hien, the gentle pilgrim began by telling of his joy at feeling again the friendship and shelter of the ancient pine under which he had spent his childhood. While its human comrade was accomplishing his pious pilgrimage, the tree had always turned toward the west, but had turned toward the east again when the hour of his return struck. In those days the very trees were Buddhists in full agreement with men.

To-day in certain Chinese monasteries you will find the image of Hiouen Thsang holding out his begging bowl in token of his teaching. I am inclined to believe that our Galilean likewise lived principally on alms. Was it necessary that the manifestations of such religious emotion, so like one another, should in many other aspects have developed differently?

More fortunate than Jesus, the two heroic apostles of Chinese Buddhism, after having experienced for a longer time than he the opposition of man and of things to a common ideal, at the end crowned a life of superhuman labor with a period of silent peace in the high company of him who had inspired them. Disregarding differences in words, which do not always express differences in thought, let us unite in a common respect toward all sincere idealists for the noble example they give us. By dint of pounding at the solid wall of the unknown, a good hammer can, and should, hit the right spot, with the happy result of breaking through.

CHAPTER IX

COSMOLOGY

BEING SENSIBLE OF THE WORLD AND INTERPRETING IT

BEFORE we can arrive through the action of our senses at those systematic mental interpretations which produce the positive knowledge of tested observation, sensation reacts in dreams, that is, in incoördinate interpretations of the things which caused it. However distinct, the two mental activities of dreaming and thinking, functioning simultaneously at the promptings of sensations of every kind, become interwoven, either to struggle against each other or to coalesce, and thus form either harmonious or discordant unions that express different phases of varying and transitory man.

Nothing more fitly illustrates those incoherent aspects of ourselves than the conflict in the matter of cosmologies between dogmatic affirmation on the one hand, and the hypothesis of observation on the other. The contradiction between sacred and secular books is such that our social hypocrisies make us silent when we should speak out.

Although the bard and the metaphysician are always trying to bring about an apparent reconciliation between themselves and the scientist, they nevertheless differ from him hopelessly. How can it be otherwise? The bard is on the stage, the metaphysician is in the clouds, and the scientist is in his laboratory. The bard holds us rapt, and the metaphysician dazzles us. Only the scientist succeeds in enlightening us. I have paid my respects to Hesiod, who prided himself on mingling fact and fiction in an effort to please. Subject to constant correction, sensation offers us the solid platform of experience on which rests the phenomenon of scientific knowledge.

Where are we? Somewhere. Since no bound-stones exist, that is all we can say. Just the same we want to be the hub of the wheel, since according to Revelation, the world

was made for our use. The bard proclaimed the fact, and the metaphysician prided himself on explaining it. But the man of science delayed. That was the first disappointment — to be followed by many another! And then, again, the bard did not conceive this universe except in the narrow terms of what we had discovered of the stars and of their courses within the limits of space as we knew it. People now talk of a beyond and of an infinite series of beyonds forever succeeding one another. Seeking the boundaries of a place that lacks all fixed, positive landmarks is an enterprise which has never discouraged either poetry or metaphysics.

Nevertheless, we can and we should demand an accounting of our earth, of our stars, and of our sky with its ordered movement. Neither songs nor dreams can straighten out that account. The Chaldeans dared undertake to see, to observe, and to distinguish the shifting relations between earth and stars. How long before their time had the first men begun to look about them without seeing? How could they have guessed that articulate speech, which was to give them immediately so great a superiority over the animal dullness of their ancestors, was to be the source of capital mistakes, the effects of which would continue to be felt even after it was recognized that words too often represent things only by misrepresenting them.

The element of time mattered so little that the problem could wait until the man of Chapelle-aux-Saints, who could utter only some harsh monosyllables at most, had through evolution unconsciously produced offspring capable of giving objective form to the elementary questions of cosmology — no less a feat, perhaps, than giving them provisional answers. As I have said, it was the business of man's divinities to supply him with a provisional foundation, resting on protracted mental inadequacy, of an ephemeral frame-work of dreams which it is now our task to replace with a solid structure.

What could the 'revelations' of theology be except silly tales fit for intelligences still struggling in the mire of igno-

rance? From primitive fetishism to the pantheism of India, the idea of a god born of man evolved along with man. That god's 'revelation' in respect to origins testifies only too clearly against the quality of his information. Suppose that the cosmogony of Moses were offered to us to-day — not having been imposed on us in our ignorant infancy — as a definitive explanation of the universe. There would be a unanimous protest. Developed in the most ancient fogs, that cosmogony nevertheless prospered until it encountered the accident of Galileo. Since then, Jahveh, made cautious by that incident and by some others of the same sort, has dared to invoke his Genesis only in the gloom of sacristies. It was Massillon, I think, who, to overcome the doubts of the future Madame du Deffand, suggested putting into her hand 'a two-penny catechism.'[1] Times must have changed, for that same catechism, circulated everywhere, is to-day put out of court by the most elementary manual of geology or of paleontology, which confounds 'infallible revelation.'

As it happens, society excels at living inconsequently. The child keeps on reciting the 'lessons' of Moses, yet before he has reached man's estate he is obliged to pass through school and through museums of natural science where the eloquent Massillon of Madame du Deffand would soon have been beyond his depth. There is too wide a gap between the explanations that myths afford and the facts that science has demonstrated, for the long conflict to end otherwise than in the final discredit of one or the other. With the earliest Chaldean knowledge of astronomy ignorance quickly squared the account by distorting it into astrology.[2] It was not with Nostrodamus that the Church found fault; it was with Galileo.

Meanwhile, there is the story of an old Breton woman

[1] The two-penny catechism is indeed highly effective — provided you add to it the support of persecution and of the scaffold. Massillon says nothing of them. So far as they were concerned, he had accepted the inevitable.

[2] An aberration that could not have been produced except through the fanciful attribution of symbolic names to deified stars, without so much as an attempt to prove any relation between the name and the star that bore it.

whose son, a sailor home from a voyage, told her that he had seen flying fish and a horseshoe lost by Pharaoh in the Red Sea while in the pursuit of the Hebrews. The woman accepted the latter piece of information, but swore that nothing would ever make her believe in so flagrant an absurdity as a flying fish.

Among all the cosmogonies that served as preface to historic religions not one can be found that offers the slightest basis for any scientific discussion. No particle of them can be left standing, even by a forced interpretation. The Vedas, the Avesta, Chaldea, Egypt, and Israel tell us nothing about the origin of things that does not contradict every scientific fact. It could not be otherwise, for it required all the great scaffoldings of experiment before the problem could be approached. Yesterday, as it is to-day, and as it will be always, the task was to define the situation of man in the universe which we must understand in order to infer the laws which we must obey if we are to put ourselves in harmony with it. The error of the primitive answer to the problem, always dogmatically maintained, resulted in consequences under the weight of which the noblest part of humanity still struggles. Those consequences were the conflicts between the nightmare of divinity and the scientific knowledge that leads to our awakening.

Indeed, our God, who is merely the Jewish Jahveh christianized by Saint Paul, persists in wanting to control our every activity. The fact is that the slight progress which science has made possible is nevertheless destined to accomplish a universal conquest of the human mind, though it comes from a source unknown to Scriptures. If it is possible for scientific knowledge to droop under the obsession of the primitive dream, how can we be astonished at the blunders in which the noisy pride of victorious imagination lands us? First let us consider the spectacle of the phenomena from which sprang the first hints of scientific interpretation. From a general point of view it is sufficiently understood that the cosmogony makes the cosmology, which latter is, indeed, but a continuation of the former.

FROM COSMOGONIES TO COSMOLOGIES

I need not here trace the innumerable conceptions of the universe in which the human mind has lost itself.[1] It is enough to recall the principal stages in human intelligence in its bold ascent toward an ever-increased knowledge of the world. Great names like those of Archimedes, of Roger Bacon, and of many other heralds of modern times are milestones along the unmistakable line of the sacred path from animal ignorance to those human misconceptions which with the help of observation were to become the approximate truths of verified knowledge.

I should like to include among eminent cosmologists King Alfonso X of Castile, who in the thirteenth century had the Arabian astronomers publish his 'Tables Astronomiques,' and who even backed them with this bold remark: 'If at the time of creation I had been admitted to the councils of God Almighty, many things would have been better made and better ordered.' For any one who took the responsibility for such a criticism, it was not a matter of indifference whether he was on the right or on the wrong side of the fence. For such a person to make such a remark indicates that the new age was decidedly on its way.

Before Kepler's time, the history of the cosmologies was nothing more than a prodigious mixture of dreams, of nebulous calculations, and of bits of scientific observation that were interpreted as superstition chanced to decree. No flicker of light appeared until one observation began to corroborate and fortify another, thus leading to the first outlines of a synthesis honeycombed with hopeless errors. This synthesis was originally one of dreams; that is, flights of imagination on which the reactions of experience were to impose the control that should either abolish or justify it.

The cosmological myths, the themes of which I have noted by way of reminder, simply reveal the first stirrings of the human mind. Nothing could be more futile than to try to lay down any principle governing the transition from the imaginative method to the scientific method.

[1] Cf. the work of Pierre Duhem.

Primitive imagination itself had need of some facts — either true or false — about the exterior world for the purpose of its creations, but its invariable practice was successively to distort them. Necessarily imagination was partly responsible for the first efforts of a knowledge that, wholly untested, was of course based on superficial observation. Conditions of mental activity and methods radically different from those that govern us to-day, arising as much in the spontaneous action of dreams as in the systematic labor of verified observation, were sure to cause inadequate and discordant results. Imagination blazed triumphantly amid the modest glimmerings of experiment, the increasing light of which later illumined the path toward the ideal which is man's goal.

'Astronomy,' says Henri Poincaré, 'showed us the general character of natural law. . . . Newton showed us that a law is nothing but a necessary relation between the present state of the world and its immediately preceding state. But astronomy supplied us with the first model, lacking which we should doubtless have long blundered about. Furthermore, it is astronomy that most effectively taught us to distrust appearances. When Copernicus proved that what we believed to be most stable was in motion, and that what we believed to be in motion was fixed, he showed us how deceptive could be the infantile reasoning based directly on our immediate sensorial reactions. To understand nature, we must get out of ourselves, so to speak, and look at it from many different angles; otherwise we shall never know more than one of its aspects.[1] Now no man who relates everything to himself can get out of himself. Who freed us from that illusion? Those who showed us that the earth is merely one of the smallest planets of the solar system, and that the solar system itself is merely an imperceptible point amid the infinite space of the stellar universe.'[2]

The first 'thinkers' found it difficult to understand that

[1] And since we cannot see all angles, we can never know more than a certain number of the 'aspects' of nature, that is, of its relativities.

[2] *La Valeur de la science.*

the various forms assumed by animate and inanimate nature in the world were not creations. The great investigators of ancient times would have approached their task with the feeling that they had neglected some necessary form, if in the manner of Indian pantheism they had not begun by making the earth and the stars out of nothingness. It seems to require a higher philosophy for a man to be willing to accept things as they are. We can satisfy ourselves of that truth even to-day by observing the disdain of all the religious folk, whether savage or civilized, for the unfortunate beings who begin their inquiry into the world by noticing what lies before their eyes. It is so simple to say at the start what we do not know, before we have reached the point of feeling any anxiety whether what we say corresponds with the phenomena that force themselves upon our attention.

'In the beginning,' there was nothing and at the same time there was God. And God, who was perfect in every respect, made the world imperfect. Grieved at his mistake, he created hell in order to punish his creature, who was wholly innocent of the divine creation. Such are the great secrets that are offered us instead of the scientific fact to which our sensibility responds both emotionally and intellectually.

The imaginative cosmologies both of the savage and of the civilized peoples of the earth form a long list of phantasmagorias over which it would be idle to linger. They were crude air-castles that attained refinement only among the peoples that were to play a part in the development of positive knowledge.

What must be clearly understood is that those primary cosmologies are really the ultimate product of prehistoric ages in which, owing to the absence of any, even elementary, criticism, every fantasy could give itself free rein. When writing began to make permanent record of the deeds of our ancestors, formulæ appeared on which vague traditions could be erected. Heteroclite mixtures of them still survive. The universal story of a world-flood is the tradi-

tional narrative of one of the last planetary cataclysms which were coincident with an indeterminate stage of the evolution of the human species. The story already marks the transition from a dream-cosmology to a cosmology of observation which is, through the increase in experimental inference, forcing its way at the expense of superannuated fables. With the new state of mind, which could no longer be nourished solely on primitive tales, another age began — an age that while awaiting the criticism of scientific observation that must be verified, had an observation of its own, based on imagination and appearances. That state of mind showed itself triumphantly in Lucretius, in whom the Greek premonition of future experimental hypotheses found fresh expression.

Toward the beginning of the sixteenth century, when Copernicus was about to mark a decisive moment in the history of astronomy, the astronomical systems of Pythagoras, of Aristotle, of Hipparchus, and of Ptolemy shared the favor of the 'learned' world. The system of Pythagoras, mystic in its inspiration, can no longer be even discussed. Heraclitus at least contributed the hypothesis of the rotation of the earth. He maintained that the sun revolved around the earth, and that the planets revolved around the sun. Those ideas, which were adopted by Aristarchus of Samos, may have given a hint to Copernicus. Aristotle put the earth at the center of the universe, and there Ptolemy left it. That the earth moved seemed to be contrary to the 'evidence.' For Aristotle, who dominated the thought of ancient times, the world was the construction of a divine rationalism — a rationalism that man postulated according to the measure of his capacity, and that required no other effort of cognition than that of retracing the course of the phenomena that he has inferred from the supposed designs of the Creator. It was at that period that a monk made the famous remark on the discovery of sun spots to the effect that 'there could be no question of any such thing, since Aristotle had made no mention of it.'[1]

[1] *Revue hebdomadaire*, March 10, 1923.

Nothing better illustrates the groping progress of the human mind than Lucien Fabre's remarkable study of the mental process of Copernicus on the eve of the supremely important observation that immortalized his name. Simplicius, Averroes, Maimonides, and Saint Thomas Aquinas agreed on 'the capital distinction to be drawn between metaphysics and the so-called astronomy of observation.' 'When we reason on eclipses,' writes Simplicius, 'there is no question of discovering the cause. We simply intend to adopt by way of hypothesis methods of looking at things that agree with the phenomenon in itself, the metaphysical entity of which inevitably eludes us.' History has only too plainly shown how far such a conception can lead us.

As indicating such a state of mind, nothing could be more pertinent than the very preface[1] of the book on the Celestial Revolutions that for thirty-six years Copernicus kept on his table without daring to publish it. 'I do not doubt,' he says, 'that the new hypothesis which is the basis of this book, and according to which the earth moves round a motionless sun in the center of the universe, is not already known. Nor do I doubt that certain erudite persons will be greatly shocked and will frown on the doubt cast on liberal doctrines, long and solidly established. If, however, they consent to withhold judgment, they will recognize that the author has done nothing reprehensible. The rôle of astronomy is, in effect, to write the history of celestial movements with the aid of observations conducted with diligence and with skill. — It is not necessary that those hypotheses, once stated, should be true or even plausible.[2] It is enough that they allow us to record our observations so that we may utilize them in our calculations. . . .' It is doubtful whether

[1] By Andreas Osiander.

[2] Did not Saint Thomas himself confirm this point when he said: 'The astronomers have labored to explain the movements of the planets in different ways. But it is not necessary that the suppositions which they have imagined should be true, for the appearances presented by the stars can perhaps be justified through some other form of motion unknown to man.' A single 'certainty' soars above everything — the 'certainty' that does not limit itself to observation.

Copernicus ever knew of this text. The first copy of his work, which was dedicated to Pope Paul III, did not reach him until a few days before his death. He had predicted the inevitable censure in his introduction. 'They will raise a hue and cry after me,' he said tranquilly, while trying to shield himself behind two churchmen who had advised him to go on with his enterprise.

To Kepler is due the honor of having spoken the final word. 'Never,' he writes, 'have I shared the opinion of those who labor to prove that the hypotheses of Copernicus may be false, but that nevertheless real phenomena may be inferred from them, as well as from their own peculiar principles. I do not hesitate to maintain that everything which Copernicus has announced *a posteriori* and proved through observation may easily be demonstrated *a priori* by means of geometrical axioms.'

The fact is that a bold astronomy, oldest of the sciences, together with the progress of mathematics that it had at its command, consolidated the first efforts of the scientific spirit into a system based on an experimental knowledge of the universe. Chaldeans, Egyptians, Ionians, and Greeks were the first to contribute that intellectual discipline by means of which the human mind has been enabled, not only to attack the most difficult problems, but also to overcome the violent opposition of the 'set ideas' [1] of misled crowds.

Precious terra-cotta tablets (in the library of Assurbanipal, Nineveh, seventeenth century before our era), the date of which may go back to the reign of Hammurabi (a Babylonian legislator of the twentieth century B.C.), indicate that in spite of the fictions of primitive myths, the Assyrio-Chaldeans were laying the foundations of a system based on science, before which 'the gods themselves were bound to bow.' In this system Marduk, the great Persian god, arranges the planets with regard to the courses assigned them, gives its laws to the moon, which is to furnish our first divisions of time (months and weeks), and fancifully divides the

[1] Ibsen, *An Enemy of the People.*

stars into imaginary constellations that accord with no conceivable reality, but that, through their subjective relations nevertheless supply us with elementary landmarks by means of which the Zodiac, that is, the apparent course of the sun across the sky, can be determined.

We know little or nothing of the origins of Egyptian civilization. It has been claimed that an African population was conquered and assimilated by Asian peoples from beyond the Red Sea. An astonishingly complete fusion must have taken place, and as far as we go back, fetishes and sun worship, mingled with myths and rites show us nothing sensibly superior to what we find in other countries. There is no historic connection between the two hypothetically joined parts of this story. No people has written so much to say so little. No people has left so many signs of so prodigious an effort, or of an effort that produced such meager results. It left admirable works of art. Except for religious beliefs, it offered nothing but question marks. There is an inconceivable disproportion between the monuments and their significance. Look at the pyramids. And yet Egypt shares with Chaldea the honor of having taken the first steps in the matter of lofty generalizations. Some day, perhaps, the puzzle will be solved.

In spite of the fixed character of its solar cult, the thought of Egypt brings us this powerful formula of the cosmic problem. 'I am all that which has been, all that which is and will be, and my veil no mortal has ever lifted.' Thus speaks Isis, the loftiest generalization of nature in an age when ideas, if they were to be accepted, required the vehicle of personality.

Thus universal life bid defiance to the inquiry of our observation, because up to that time we were not able to do anything except dream its problems, giving as our excuse that we could thus solve them at a stroke. And that 'veil,' that mysterious 'veil' of things which with its long-victorious obstinacy resists our persistent hope of penetrating it — is it not the enigmatic world of the divinity that dares us lift it? Are we definitively proclaimed powerless, or does the

cosmic mystery clearly challenge us to redouble our efforts to decipher reality? The goddess of Sais did not declare: 'No mortal *shall* ever lift my veil.' She said: 'No mortal *has* ever lifted it.' Who will try? Terrestrial life eagerly picks up the gauntlet.

However, are not those proud words, which come to us from Plutarch, clearly characteristic of the most sharply defined Hellenism? In prehistoric ages the Ægean sea helped the fusion of the thought of Egypt with that of the incomparable Ionia, which showed a daring aggressiveness toward the veils of the divinity. The founding of Thebes, the Egyptian statuettes of the tombs of Mycenæ, the Greek shields with Egyptian characteristics[1] found in the cave at Crete where Zeus was reared, the Apollo wearing the pschent on his head, the Apollo of Miletus,[2] the Hera of Samos, and the narratives of Herodotus, so full of comparisons between Greek and Egyptian gods, bear witness to common activities of thought. If, as Renan would have it, Greece was 'miraculous,' it was, perhaps, because Asia and Egypt were brought together expressly to create the 'miracle' of thinking man. And if Egypt in its profoundest self reveals above all else the effect of Asiatic influences, which were eminently favorable to individuality of thought, and which filtered into the country through the different divisions of the Greek mainland,[3] we have detected the source of the fine origin of that superior evolution from which sprang the phenomenon of Europe. Did not the genius of Raphael make that point magnificently clear in his 'School of Athens,' in which poetry, mathematics, astronomy, physics, biology, and philosophy — all the achievements of the human mind — made the star of the ideal toward which we are all proud to struggle burst forth in the heavens?

[1] The Kandy Museum.

[2] At the Louvre, a beautiful archaic bronze which is a free copy of the Didymean Apollo (end of the sixth century) shows us in the work of Kanakhos, the famous sculptor of Sicyon, the straight line of square shoulders that is one of the most marked characteristics of Egyptian statuary.

[3] Whatever German opinion may be, the Dorians cast into the Greek melting-pot nothing except a robust will-power — a thing not to be disdained in view of Ionian enervation.

But man is still manipulating the earliest levers of knowledge, amid the mist of pride that rises about him, as much from error as from truth.[1] Imagination and observation were still rivals for preëminence. Blind fate still holds the future in suspense, and for the scientific mind it is a great disadvantage that it can promise nothing more definite than hope. Is the end of our noble dreams, which took such beautiful flights, at hand? It is the problem of deciding between appearance and reality that India, with its bewildered metaphysics, so ingeniously stated. Shall we follow Maya, illusion, or Vidya, knowledge . . .? It is a hazardous transition. Shall we ever be able to say that we have achieved it?

The passing centuries have made alluvial deposits of positive experience which, though hidden under imaginative cosmogonies, irresistibly tend for good or for evil to condense and to become coördinated. And appearances themselves, which are not always deceitful, may still chance to offer us a base of operations. Imaginative observation, that is, hypothetical observation, or verified observation are the crossroads of Hercules, with which thinking life has bid us come to terms.

At a decisive moment of history, by one of those chances to which the fated evolution of the human mind exposes us, there appeared a people fitter than any other to start the noble aspirations toward idealism that were to take complete possession of the men of highest intelligence, and that were never again to leave them. That was the heyday of Ionian Hellenism. The sequence of great names which followed each other in Greece indicates the proud achievement of a superior human task — an achievement to which we owe the existence of the thinking men of to-day in whom is forming the thought of to-morrow.

Unfortunately, Hellenism could not embody itself in a stable national, political, and social order. In the field of philosophy it magnificently extended the great lines of its

[1] In his fine history of French literature Gustave Lanson wisely remarks: 'Truth has frontiers that error easily crosses.'

investigation in the direction of the highest thought. Conquered by the Macedonian, deformed under the hand of Rome, debased by Byzantium, Hellenism knew how neither to maintain its identity nor to die in the shroud it had proudly woven. Though it did not actually perform the miracle, it yet left us the means of performing it; for it bequeathed to us the finest and strongest foundations of knowledge on which to erect the superstructure of future idealism. It was brilliantly successful in poetry and in æsthetics as well as in the most subtle accomplishments of the higher reason both in science and in philosophy. In council as in action Greece produced the most notable exemplars of virile character. The same shores of the same continent, and the same Mediterranean waves over which came to us the great vibrations of the Indian mind were able in the wreck of the Græco-Roman world to bring to us the Christian tidal-wave of the East under which all the emotional lands of our continent were submerged. It was the hour

> '. . . when the astonished earth
> Bowed 'neath the burden of the fallen skies.' [1]

Why was it necessary that the new world, so proudly predicted, could not be realized except as a word in our vocabulary? Nothing in the actual lives and conduct of man was changed in the least. The labels have been changed, but the permanently underlying impulses to violence have remained the same. Blood flowed everywhere and always. However, the world refused to end, and the man to whom the year one thousand brought disappointment ended by turning to the 'Renaissance' to seek rewards previously denied him.

It was nothing — merely a few centuries of disappointment. Throughout the cruel struggles of the Middle Ages, the youthful vitality of barbarian blood was to prepare the surprising renewal of antiquity. Abélard and his band of scholars were to beat at the gates, closed for centuries, which

[1] '. . . où la terre étonnée
Portait, comme un fardeau, l'écroulement des cieux.'

gave access to the long-deserted highways of knowledge. Hellenism was to be recovered, not only in its cosmologies, in its Asian metaphysics, and in the realm of art, but also and above all in its bold syntheses of nature, requiring the test of observation. Human labor again took up its task in the workshop of eternity.

Then followed the grand parade of the great Ionian thinkers and of their legitimate descendants. The first observations of Chaldea and of Egypt had founded astronomy. The *gnomon*, already well known in China, landed, no one knows how, on the mainland along the Ægean sea. And Thales of Miletus, a simple itinerant trader, whose comrades never ceased to rob on the high seas whenever circumstances were favorable, gave up his profitable traffic in order to determine the seasons and to measure the diameter of the sun. Seven hundred years before our era he had made himself one of the seven wise men of Greece — men who made the first skeleton of an Academy, which was the symptom of a revolution in a world until then more occupied with profitable violence and with dreams to which it sought to give metaphysical form than with scientific knowledge.

Hand in hand with Thales, went Anaximander, Anaximenes, both natives of Miletus also, and Heraclitus of Ephesus (sixth century B.C.), who approached cosmology with a view to eventual solutions of mingled science and imagination. Facts were coördinated, views were systematized. Heraclitus, first of all, boldly advanced the principle of relativity. Xenophanes of Colophon, Archelaus, Diogenes of Apollonia, and Empedocles began an investigation into nature; Leucippus — another native of Miletus — Democritus, and Epicurus based their theory of the world on the atomic hypothesis, to-day verified. Mathematics contributed its tests and its support and opened its vistas. Aristotle established physics and natural science. Pythagoras declared that the earth was spherical, and Philolaus endowed it with motion. Meanwhile, Parmenides, to get the full benefit of opposing methods, applied metaphysics to the

indifferent universe. Finally Plato, herald of learned metaphysics, together with Aristotle, theorist of nature, paved the way for the great reaction against entities, essences, and entelechies which were finally disposed of by Hipparchus, Ptolemy, Roger Bacon, Copernicus, Kepler, Galileo, Newton, and so on to Lavoisier.

The life of Galileo was preëminently the tragedy of the man of science at grips with the savage traditions of a long nightmare of imagination. He began by laughing at them with Kepler; he ended by weeping over them. He used to say: 'My body and my name will not be buried at the same time.' He had to wait only two hundred years for the 'infallible' Holy See to declare it 'licit' — September, 1822 — to teach that the earth revolved around the sun. And meanwhile the 'rehabilitation' of Joan of Arc — glorious manifestation of the dogma of 'infallibility' — awaited its turn.

With the completion of the work of Newton, the formulæ of whose law of gravitation are to-day familiar to the whole world, we seemed to have reached a stage in our effort to understand the Cosmos at which thousands enough of years had rolled by to permit us to pause in the immense undertaking of a human conquest of the universe. That universe, with its fantastic spectacle of revolving flames, had been there before our eyes, and the artless lens of the telescope of Galileo had dazzled us with a whirling mass of monstrous will-o'-the-wisps. Isaac Newton set down the laws of their revolutions. When we had rid ourselves of the primitive fables that through long established misconception had sunk their roots so deep both in our deeds and in our words, it seemed a suitable moment to hold fast to this simple formula of cosmic motion: 'In the universe movements take place *as if* any two bodies were subject to a reciprocal attraction, proportional to the product of their masses, and inversely to the square of their distance.'

That is the law of gravitation by means of which one abyss of the unknown was definitely crossed, subject to possible correction by future discoveries. We are one of the transient products of the universal and eternal activity of the

Cosmos. Our consciousness of things is intent on identifying our lives with the evolution of thought, which could not be other than incoherent if it were not the dominant factor in the conscious activities of the universe. That intervention of our individual organism in the government of life (in which the power of the Ego itself is included) constitutes the ultimate synthesis of our energies under the emotional impulsion of our sensibility. The great dreams of metaphysics prepared the way for the great mental achievement of a finally realized scientific comprehension.

And if man must continue to dream, although in new ways, of that which he cannot attain, a new poem will take the place of the poem from which the poetry has departed and will keep our emotion in the current of hopes that we have never hoped before. That poem is the living ideal which no scientific knowledge can destroy. Whether the ideal is lofty or (as is usually the case) only mediocre, our aspiration toward a superior harmony inspires, deep within us, decisive action on our part. Whether it be in complete or in imperfect agreement with the realities of the exterior world and of man himself, the effect, we must admit, will be the same, for all contradictory opinions or beliefs have in turn produced identical human virtues.

We cannot expect an absolute conquest of the ideal from organic emotion, progressively transposed into a different key in the course of the evolution of knowledge. Like all other organic activities, our ideals must be in exact relation to our limited power of imagination. That is enough to assure the continuity of our legitimate self-manifestation, since there dwells in us a power of successive emotions, ever ready to renew our energies. One might, then, claim that the ideal is the prophecy of an emotional state that will continue to be transformed in proportion as the elements of our hasty conjectures are eliminated through the effort of accrued knowledge. We march with supporting troops; imagination sustains our courage, and experiment secures our safety. We must at all costs keep the paths of knowledge open, but for that very purpose it is necessary to keep

on the march regardless of risk. Whatever star we follow, its light will always be more profitable than darkness.[1]

SCIENTIFIC COSMOLOGY

In the primitive period of our humanity the sky was the same as the one studied by Copernicus, Galileo, Kant, Newton, Laplace — by all the men of intelligence who were seeking a new field of human knowledge. Yet, through simple changes in interpretation, what a gap there is between the vision of that period and the vision of to-day! When the Chaldeans bethought them to group the various stars into diagrams, so that they could give the fictitious figures names which would allow them to recognize the course of the sun, it seems to have been understood by every one that there were actually in the sky no bull, no scales, no scorpion. However, the crowd, as always, rushed headlong into the mythic illusion that tends to appropriate the universe to the purposes of the human species. Stripped of their magic, the fictions of the Zodiac have nevertheless remained helpful to us amid all the obstacles to the progress of knowledge. They are the last vestiges of an astrology which endowed the stars with an especial life by giving them chance names, thus permitting them to impose their laws upon us instead of enlightening us. Too many other gods, lingering behind in the forms that primitive personification had given them, continued to exert their superhuman wills upon our actions and reactions, with the result of holding us back from entering upon the natural course of our destiny.

When Newton gazed upon the celestial immensity across which he had cast such a brilliant and permanent gleam of light, he was satisfied with the notion of a mysterious mechanician running the engine. The idea of submitting the 'motionless motor' of Aristotle, the problem of which still puzzled men, to the procedures of investigation did not occur to him. How many others had had that courage who,

[1] I am not afraid to say that the question of the ideal is, like God himself, in whom I see no more than one of its categories, a chapter to be given its proper place in cosmology.

either by reason of their own deficiencies or because of the poverty of accumulated knowledge, had been unable to point out the main road among the trails of observation.

Weak or strong, we are one another's legitimate heirs, and we inherit the sum of human failure and success. The ordinary man of to-day possesses without effort on his part a quantum of knowledge which the most famous teachers of antiquity would have envied. Scarcely do we cross the doorsill of birth before we define our position in the life that offers itself to us by the stages that man has passed. The adventure of living necessarily carries with it a growth of yesterday, surpassed by the growth of to-day and of to-morrow. Life is a succession of mingled knowledge and misconception, constantly and actively increasing, according to the chance which each one of us has later to contribute through his own individual effort.

From that point of view, what is more significant than to see Newton, unable to solve the problem of planetary perturbations because the mathematics of his day were imperfect, placidly invoke divine intervention to remedy the difficulty? He did not hesitate to declare that the hardly perceptible irregularities of motion, which may proceed from the reciprocal action of planets and of comets, will, through a long period of time, keep on increasing, until finally the system will have to be renovated by its creator. How incredibly ingenuous it is to be willing to entrench yourself in human incompetence, meanwhile attributing to infallible Providence the rôle of an unskillful clock-maker who at certain intervals has to give a push to the hands in order to make up for the imperfections of his wheel-work! And the best of it is that, with the development of differential calculus, Newton's law is of itself adequate to explain the planetary perturbations. Every one knows the counterproof that Leverrier supplied through his discovery of the planet Neptune. The supreme generalization of Laplace was required to note the stability of the universe and the instability of our interpretations, which it did in these terms: 'If we run through the history of the

progress of the human mind and of its errors, we shall see final causes constantly fall back to the boundaries of knowledge. Final causes are, then, in the eyes of the philosopher, only an expression of our ignorance of true causes.' What a tempting invitation to ponder on the world and on ourselves!

Meanwhile, it certainly is the same fragment of moving infinity that lights or blinds us with the unchanging splendors of its light and of its darkness. From whatever place the luminous shaft may reach us, the flare of our torch spreads the accident of vision, correct or distorted, to every point of the horizon. Like the animals in the fable who through faith saw in the magic lantern all manner of things which the monkey's candle-end did *not* show them, we are pleased to attribute a fictitious 'reality' to the phosphene which leaps vibrating from our overexcited retinas. At the spectacle of the stellar world, every sensorial fiber awakes to tumultuous life under a sky that hints at mysteries, which have no formula except when a man comes along who can grasp and explain them.

Sometimes, astronomers, by hypothetically shifting their telescopes so that they are pointed from a different planet than the earth or from a star — looking toward the very limits of our stellar world — accomplish imaginary changes in the sky. By changing the point of view, a novel arrangement of things creates a heaven different from the old through the apparent novelty of the relations among the moving masses. In that fashion the diagram of the stars in the sky can be infinitely varied.

Amid the formidable complexity of inseparably connected cosmic forces, we realize space and time by the aid of the momentary ebb and flow of the energy that marks stages in the progress from birth to death. Space and time contain such multitudes of worlds that all the stages of their existence — or, at least, the most significant of them — are simultaneously before our eyes. The curve of the earth is so pronounced that on the open ocean we can see only a few miles. And yet the great blue vault, lit with the starry

torches of an unending festival, ultimately offers to our vision no more than half-seen beacons on the confines of the unknown.

There is no reason why in the sequences of time and space still other universes should not exist to renew our interest. Infinite time is very long, and infinite space reaches very far —

'Guess if you can, and choose if you dare.'[1]

The amount of our universe within the range of our perceptions is, in its finality, beyond the reach of any present effort of our comprehension. To admit that truth without false shame marks real progress. Honor to him who, while leaving to man free recourse to the powers of imagination, when estimated at their true value, knows how to distinguish what he knows, whether well or imperfectly, from what he does not know, and from what he cannot know! Whatever happens, establishing relations between the heavens and man is the very height of the drama in which the impassive unconsciousness of the cosmic elements is confronted with the acute consciousness of a humanity eager for knowledge.

In a few very simple words Kant has described his confused thoughts and fancies when contemplating the celestial veil as amid terrifying crashes of thunder the lightnings played across it. Descartes argued for a whirling world; Kepler, in love with the idea of universal harmony, discovered the fundamental law of planetary motion. Newton made each and every activity of the Cosmos subject to the universal force of gravitation. Man and the universe, so long pulled now this way and now that by the deceptive appeals of things unknown, could at last be harmonized in a better formula expressing a general theory which was based on verified observation.

Such is the Newtonian world which, pending new discoveries, evolving man is bound to regard as an adequate representation of what is outside himself. There are formulæ of the sun, of the planets with their satellites, of the

[1] 'Devine si tu peux, et choisis si tu l'oses.'

stars, of the Milky Way, of the spiral nebulæ, of the comets, and of cosmic dust amid which worlds that, as they pass, give us glimpses of their secrets, blaze forth or are extinguished. We have caught all these prodigies of the interlocking elements of our always and of our everywhere in the irreducible coördination of the netted links that even beyond the regions to which the utmost reach of human conception can attain doubtless bind them together.

For if gravitation is not the law of the universal universe, how is it possible to conceive the boundary line at which it meets relations of a different sort? There must be some connecting link between the two kinds. It is a puzzle in hair-splitting propounded to the Christopher Columbus of the heavenly expanses. Beyond all positive observation, however far that may reach, man will always encounter the shifting frontier of the unknown. In company with Newton we can note the fact that, since the time of Moses, the cloud of mental obscurity has completely shifted position, and that we have firmly grasped coherent formulæ on the hither side of which the childish dream of primitive ages is dissipated. Those who persist in living, like their ancestors, amid sensible terrors, can always immerse themselves in metaphysics. Whatever pleasure a man may take in sleeping away his life on the pillow of Revelation, or in living it amid the anxieties inseparable from experience, the state of man, even after the conquests of science, promises nothing better than the trepidation of a knowledge constantly approaching an unattainable absolute.

Kant and Laplace, fascinated by scientific facts, could not be stopped at the edge of the abyss by any fictitious parapet. Courageously they plumbed the depths. I shall not expatiate on their hypotheses.[1] Kant, whom Laplace did not know, states his problem in these terms: 'The task is to discover the system of laws that bind together the created

[1] I disregard the hypothesis of Buffon. *Les Époques de la nature* has today only an historical value. Although the author stood on the threshold of modern times, he believed himself obliged to try 'to reconcile once and for all natural science and theology.' That fact did not prevent his being condemned by the Sorbonne and later making a humiliating apology.

worlds in infinite space and, exclusively by the laws of mechanics, to deduce from the primitive state of nature the formation of the heavenly bodies and the origin of their motion. . . . At the same time religion threatens with its thunderbolts the bold man who shall attribute to nature alone a work in which the Church for good reasons sees the direct intervention of the Supreme Being. . . . Only after having made my knowledge safe from a religious point of view did I lay out the plan of my undertaking. . . .' Thus, even at the dawn of the nineteenth century, did men still write in order to get at any cost the permission of the Church to undertake scientific study.

The philosopher of Koenigsberg sought the explanation of the stellar universe. Cooling by radiation; increasing but unequal condensation determined by the substance and by the interior movements of the mass; opposition of centripetal and centrifugal forces; rotation; gravitation; contraction that produces the nebular rings thrown off in the orbit of the forming planets (of which Saturn is evidence) — such, according to the hypothesis of Kant, appeared to be the phenomena which succeeded one another from the extreme dispersion of atoms in the 'chaotic' nebula to the formation of the world in which we struggle.

Kant's misfortune was that he needed the old pagan chaos as a pretext for the intervention of his god — maker of all things — a need which condemned an immobile universe to be the starting-point of motion. The theory is difficult to accept, since we do not know, and cannot conceive as existing in the world, anything except activity without beginning or end. And in conclusion he says this: 'God exists precisely because chaos itself can engender only order and regularity.' Really we should be able to infer from Newton's law something more than that order is founded on universal disorder.

Kant, in spite of the metaphysics which still engrossed his powerful mind, remains the great forerunner of Laplace in the noble attempt toward a scientific cosmogony, even the unverified hints of which were of service to the student.

A simple suggestion of Laplace's enlightens us: 'And why should not these universes that in the form of nebulæ are scattered through infinite space, form a unit, a superior kind of system, in which those nebulæ, including our own, slowly revolve around a center?' That great hypothesis of a world of worlds which makes us glimpse further opportunities for cosmic observation has not been abandoned to this day. That is much. Human intelligence can always enlarge the limits of its knowledge, but can never abolish them.

Laplace suggests the elements of an hypothesis worthy of a man of genius, and which he modestly presents 'with the distrust that everything not the result of observation and calculation should inspire.' No one could put less pretension into so audacious an undertaking. However, it is indeed necessary that both observation and calculation should be at the base of every scientific hypothesis of the Cosmos. Laplace, therefore, is entitled to no small share of the glory due to all the observations and to all the calculations that have corrected and recast his hypothesis, in order to give it new life by adapting it, with every effort to make it accurate, to our increased knowledge.[1]

Laplace, devoting himself exclusively to the study of the solar system, planned to show that universal gravitation was sufficient to account for the phenomena revealed by the revolution of the stars. The fact that the planets moved in the same direction around the sun led him to think that by reason of excessive heat the sphere of the sun extended in remote ages beyond the orbits of all the planets, and that little by little it was condensed by radiation to its present size. Thus originated the hypothetical evolution of the nebula which has been the subject of so much discussion; and to date no one has succeeded in establishing another thesis on different foundations. It is purely a physico-chemical

[1] In the work of Louis Maillard, *Quand la lumière fut*, the reader will find an exceedingly clear summary of the cosmogonical hypotheses of Faye, Belot, and Moreaux, to which Laplace was indebted, and which contributed to future cosmogonies.

conception of a universal mechanism in which nothing appears, nothing disappears, and everything consists of motion without beginning or end. 'If the hypothesis is old,' Henri Poincaré remarks, 'its old age is vigorous, and, considering its age, it is not much wrinkled. In spite of the objections that have been raised against it, and in spite of the discoveries that astronomers have made, and that would have thoroughly astonished Laplace, it still stands, and it remains the one that best accounts for very many facts.'

We have gone a long way from the sacred cosmogonies which allowed astronomy based on observation to founder in the mythic interpretations of astrology, which was confounded with astronomy until the time of Ptolemy; that is, as Bailly remarks,[1] for a period of fifty centuries. Only two hundred years ago was it tossed into the dustbin of misconceptions. Nothing better shows the incredible vitality of the most absurd fancies, whereas the elementary truths of science still find many minds which rebel against the simplest effort at verification.

I cannot be expected to give a history of astrology. However, nothing from Chaldea to Hipparchus, and to Ptolemy, more clearly marks the persistence of man in his effort to establish a relation between the stars and the course of his own destiny. The path of scientific astronomy and that of imaginative astrology were too divergent ever to meet. Moreover, the opposition-of dogma to systematic observation was bound to be more formidable than its opposition to sorcery. The lesson of a highly scientific mind, such as that of Tycho Brahe, which, rebelling against Copernicus, sought to restore a motionless earth as the center of the universe, is, perhaps, no less suggestive than the incomparable effort of Copernicus himself to escape from the revelations ('finalities') of theology. The unfortunate Galileo, before the remarkable corroboration that Kepler brought to the Copernican theory when he established planetary revolu-

[1] We have retained in our current vocabulary formulæ like the one which describes us 'as having been born under a good or under an evil star.'

tion, turned to Copernicus, and was thus led tragically to fulfill his fate.

The movement of the sun in an orbit inclined toward the equator, the correspondence of the seasons as well as that of the moon with its phases, eclipses — inexplicable until our knowledge of them was proved by the certainty with which they could be predicted — planets, the sphericity of the earth, the constellations, and the Zodiac were all discoveries of prime importance in ages that have left no history. 'We can judge,' said Laplace, 'of their great antiquity only by the astronomical cycles that have come down to us, and that imply a series of observations proportionate in length to their importance.' You will find in his lucid 'Exposition du système du monde' successive studies of the heavens and their results. There you will find that since the time of Hipparchus the entrance of the sun into the constellation of Aries marked the spring solstice, and that the relation of the constellations had already become markedly different from that which the astronomers had established at the time of the original institution of the Zodiac. And when it is pointed out that not less than fifteen thousand years have passed since the time when the constellation Auriga was at the highest point in the path of the sun, and the Scales (which indicate the equal days and nights of the equinox), were at the spring equinox, and, moreover, that the constellations of the Zodiac are in 'striking correspondence with the climate of Egypt and with its agriculture,' you will gain some idea of how remote are the beginnings of astronomical study.

Without neglecting such valuable hints, let us be careful not to be too specific until we get the necessary corroborations. It is better to consider this simple observation, which is now current, and which Louis Maillard in his widely read work sums up as follows: 'Admitting that the total substance of the solar system was originally a globular mass much greater than the orbit of Neptune, we can calculate the amount of heat that it would engender while contracting under the influence of gravitation, by taking abso-

lute zero (−273° Centigrade) as a starting point. Now, the age of the sun will be greater or less than eighteen million years, according as in previous ages it lost more or less heat than it is losing in its actual state. On the most favorable supposition, the sun cannot be more than fifty million years old. Now, according to the physicists (Lord Kelvin) the age of the earth is at least one hundred million years, and, according to the geologists, several hundreds of millions.[1] Question! I quote only to show with what measures of time in the fields of the unknown our imagination is asked to deal. Poor Cuvier, who sometimes went so far as to say that the earth was approximately six thousand years old!

I have said that Aristotle recorded Chaldean observations that go back nineteen centuries before Alexander, and that Ptolemy takes us back only to the Chaldeans of the year 720 B.C. The establishment of the week, which we find again in India, is supposed to have originated with the Egyptians. From India comes the invaluable system — unknown to Archimedes — of expressing all numbers by the use of ten characters. In Greece Thales of Miletus taught six hundred and forty years before Christ the sphericity of the earth, the obliquity of the ecliptic, and the causes of both solar and lunar eclipses.

For that same teaching, Anaxagoras, standing beside Aspasia (saved by the tears of Pericles), was condemned to death by the Athenians, who reproached him with having destroyed the influence of the gods on nature through his attempt to make natural phenomena subject to unchanging laws. His sentence was later commuted to exile. Here, at least, we find a question clearly put. Indeed, it was so clearly put (Socrates was about to drink his hemlock) that on the problem of cosmogonies and of the consequent system of the management of the universe, the conflict arising out of the first efforts of scientific knowledge — supreme

[1] Cf. *Quand la lumière fut.* Read the chapter entitled, 'Esquisses d'une cosmogonie générale,' if you would see the extreme point at which, rising from hypothesis to hypothesis, we may *perhaps* succeed in reaching infinity.

insult to revelation — was to become daily more and more bitter, up to the monstrous outbreak of the Inquisition.

Finally, in the middle of the seventeenth century, Galileo, for publishing dialogues into which he had not dared to introduce any formal conclusion, heard himself condemned to perpetual imprisonment *after* he had signed this formula of abjuration:

'I, Galileo, being in the seventieth year of my age, personally appearing before the court, on my knees and having before my eyes the Holy Gospels and touching them with my own hands, do with a sincere heart and a sincere faith abjure, curse, and detest the error and the heresy of the theory of the movement of the earth. . . .'

The movement of the earth a heresy! The consent of the priesthood was necessary in order to record the results of observation! If the Church had been able to maintain that position, there would have been an end of science; that is, of the development of the human mind.[1] As a method of putting the seal of approval on like incidents, the 'sovereign pontiff' to-day bids us take notice of his 'infallibility'!

In 1642, the year that Galileo died, Newton was born. The law of universal gravitation was about to be enunciated, carrying with it a conception of a world-system based on exact and ordered movement. What a weary way the world had traveled to reach that point!

FROM THE EARTH TO THE SUN, TO THE STARS, TO THE NEBULÆ, TO WORLDS IN EVOLUTION

The remarkable progress of physics and of solar chemistry has made invaluable contributions to the astral history of our universe. I shall not dwell on the solar theories, any more than on the different hypotheses of a progressive decalorification ending in inevitable death. The photosphere, or incandescent kernel, that is only a few thousand kilo-

[1] Two hundred years before our era a Chinese Emperor burned all the manuscripts in which had been recorded all the ancient methods of calculating the eclipses. He was an innovator who believed it necessary to get rid of the past and to start over again.

meters thick, the chromosphere, the spots that have a direct relation to terrestrial magnetism, the corona, the eruptive prominences that over a space of more than one hundred thousand kilometers shoot whirlwinds of flame more than three hundred thousand kilometers from the solar surface, the rays of the spectrum, the luminous radiations — calorific, electric, magnetic — and the pressure of radiation are now commonplaces of teaching. The 'normal' rate of combustion of the flaming mass would give the sun only an approximate life of some thousands of years. To this day the geologists claim for it a life of one hundred or two hundred million years — an ample margin for theorizing.

On the other hand, planets and satellites at different stages of evolution produce an immense variety of planetary phenomena in a continuous sequence of evolutionary forms, which constantly present every aspect of cosmology.

I will not enter upon the classification of the stars, which are undergoing the physico-chemical evolution that determines their different spectra. White, blue, red, giant, dwarf, medium, single or double, they successively progress toward extinction. I should never have done were I to discuss their distribution, the star-clusters, the nebulæ and the Milky Way.

The figures are more than ever disconcerting.[1] Professional astronomers perhaps succeed in training their imaginations to grasp them. When I am told that Betelgeuse (in Orion) has a diameter two hundred and forty-eight times larger than the sun's, and that Antares (in Scorpion) has a diameter four hundred and sixty times larger, or that, if placed at the center of the solar system, the globe of Betelgeuse would overlap the orbit of the earth, I cannot learn to feel at home in surroundings which disturb me

[1] And how much more disconcerting still if we undertake to shift the position of the observer! It has been computed that if the sun were placed in the cluster of Hercules, the light it emitted thirty-four thousand years before the Christian era would only now be reaching us. There is no standard measure for anything in the universe. We pile up figures in our investigations, but the true relations necessarily escape us, owing to the lack of any common proportion.

because they are so far beyond the reach of earthly measurements.

To cap the climax, we are forced to admit that the image we see of the universe, composed of stars the light of which reaches us after an interval which varies with the distance, is totally different from present reality. It must be so, for each celestial beam which reaches us to-day brings us a picture, not of what exists now, but of what existed in anterior time. From the nearest star — Proxima Centauri — the light ray, traveling at the rate of three hundred kilometers a second, reaches us four years after its departure. Thus, to-day, we see that star as it was four years ago. Were Proxima extinguished at this moment, we should continue to see it for four years. Say fifty years in the case of the North Star. Set down in figures, if you can, the number of stars and the distance of each from our observatory, and amid that tangle of differences, check up your bold attempt to straighten out the facts. Yet I say nothing of those clusters of stars, of those gaseous or spiral nebulæ, the light waves of which, as Maillard points out, 'started hundreds or thousands of years or of centuries ago.' Let us live in the delayed light of the flaming stars, and let us be content to wrest from them hints of activities that open a path to the secret of another age or even of eternity.

It would be futile to try to express in millions the approximate number of the 'dead' stars variously distributed and grouped in formations imperceptible to us.[1] Collisions among the stars produce novæ; that is, stars that break into flame and disappear before our eyes. We are told of swarms and of stellar streams, and, as if overwhelmed amid the tempests of flaming oceans, we become lost in the outer fringe of our Milky Way, which, amid the luminous encounters of its innumerable suns, perhaps conceals the enigma of a superior cosmic conception.

[1] To what extent can the characteristic movement of the stars be merely an illusion caused by the progress through space of the whole solar system? The question has been raised. All that any one can say is that the sun with its train of planets is moving in the direction of Hercules at a speed of twenty kilometers a second.

At this point Maillard most appropriately cites Montaigne as follows: 'Our investigations, when carried to their limits, everywhere encounter matters that dazzle us.' Indeed, the activity of the atom is not less marvelous than that of the Milky Way. The story of a grain of sand is as important as the story of Antares. Why is not the adventure of a flower, the adventure of a world, or the adventure of a thought equally interesting to us? Our problem is to know whether we should keep to human lethargy only to be engulfed in an accepted impotence, or cast an appraising eye upon the obstacle and then try our powers against it. Though some may flag and others may recoil, the noble continuity of human effort in the field of experimental science has already definitely established the greatness of our transient destiny.

The intimate correlation of cosmic phenomena necessarily requires a similar evolution which is manifested in changed aspects that reveal their successive coördinate states. Laplace starts from the explanation of those changed aspects, beginning with the 'antecedent general nebulosity.' [1] It is not surprising that there should remain an ample margin for the views of Herschel on the development of stellar nebulæ. Every criticism is welcome for the sake of the constant correction of a knowledge always being renewed and always increasing.

The simple history of our planet as science reveals it is already reasonably clear. In successive centuries we see sediments arranging themselves in an orderly manner, and the first manifestations of life are recorded in them in correlative forms as they cool. And while the planet, swarming with competing lives, carries us on in the midst of indifferent time and space, we discover that the atom, like the stars themselves, of which it is the elementary constituent, hastens toward a similar evolution.

The 'stability' of the solar system and even of the Cosmos can be nothing but an order of movements following

[1] The idea of an original nebula originated with Leibnitz and was taken up again and perfected by Kant and Laplace.

unplotted curves where the collision of stars, hurled like projectiles, can themselves be only ordained manifestations, among which the gestation of the thinking universe [1] is included.

Arguing solely from the loss of solar heat and from the effect of that loss on the planet on which the evolution of our thought unfolds, Helmholtz gives our earth a future of not more than six million years, and it is to be feared that the last of them may prove difficult for us! I have already said that the geologists claim that a period of approximately from one to two hundred million years was necessary for the formation of our fossiliferous strata. Helmholtz is content with only ten million. 'It seems probable,' Arrhenius [2] concludes, 'that we should calculate on one thousand million years.' Our remote descendants are thus warned in advance.

The substance of the stars would seem to be in all respects comparable to that of the earth; and the stars, physically and chemically like our world, reveal evolutionary phases which correspond with those that our earth has presented or will present. The stellar spectroscope wonderfully enlarges our view in this matter. Sirius, twenty-three trillions of leagues away; Aldebaran, distant thirty-two trillions of leagues, contain our familiar metals at degrees of temperature not impossible to calculate and compare. Stars burst into flame, wax, wane, and disappear. It is an ordinary incident of infinite space. Meteors and cosmic dust warn us that everywhere there are explosions in the Cosmos, indicating the occurrence of stellar disasters of which we can know only the remote effects. Helium was discovered in the sun twenty-six years before it was found on the earth. A green line in the spectrum revealed an unknown gas in the nebula. Why not name it nebulium?

[1] I mean by that phrase the indeterminate coördinations of the cogitative phenomena that, according to all appearances, are diffused in those parts of the universe where from time to time the conditions necessary to more or less complete life are found.

[2] *L'Évolution des mondes*,

It was done. And many other elements have received names, if nothing more.

'We have reason to believe,' writes Arrhenius, 'that the sun which is to-day a yellow star was formerly a white star like the splendid Sirius, and that it gradually cooled until it assumed its present appearance, and that finally a day will come when it will emit a red light like Betelgeuse. It will then diffuse only approximately a seventh of the heat that it now sends into space. Probably the earth will be merely an icy desert long before that moment arrives.' By such more or less dangerous inductions is the more or less hypothetical history of the stars brought into relation with the facts known about the sun. Pending verified knowledge, estimates of the possibilities anticipate the verifiable hypothesis. We are in a more or less penetrable fog halfway between experimental science and imagination, in which we should take care not to go astray. The advance of knowledge is remarkable enough since the relatively recent day when Catherine de Medicis, in that tower of hers that still stands in Paris, waited until her astrologers, through their observation of Mars and Venus, should satisfy her as to her individual destiny.

The discovery of radium has wholly upset our point of view of solar energy. As yet there can be no question of estimating the rôle of radioactivity in the combustion of the star that controls our destinies. We cannot, however, ignore so great an opportunity for investigation. Rutherford, an eminent authority on the point, thinks that radium requires a thousand years to reduce itself by half, and yet it gives off a million calories a gram a year — two hundred and fifty thousand times more than is given off in the combustion of a gram of carbon. Naturally people have taken it as an excuse for adding strings of ciphers to the figures representing the uncertain duration of our planet.

Let us leave the comets to their generally unforeseen whims, and let us calmly approach the problem of the nebulæ, so far as the magic lantern of our celestial bodies permits. The less we know, the more willingly do we talk.

Since the time when the regulated imagination of Kant and of Laplace, seeking cosmic fact, demanded from the changing aspects of those mysterious lights the secrets of the transformations of the universe, such has been, to some extent, the story of our nebulæ.

The nebula, a mist of light, for a long time failed to attract the eyes of the astronomer, who like the moth fluttered into the flame. Then, when he had duly burned his wings, he bethought himself that the clear luminescent spaces in which there were signs of motion might offer a key to explanations which would show cosmic matter — in the evolution of its energies — from the infinitely diffused, barely coherent masses to the condensed form of the star, of the sun, and of the succeeding planet on which transitory human consciousness awaited its day.

Unaided, Herschel discovered more than two thousand nebulæ. Until then astronomers had taken note of only a few. To-day they divine so many which escape our vision that many persons are ready to see them in the very field of invisibility. Recent discoveries have established the number of nebulæ as incalculable. These heavenly bodies cannot be anything except collections of cosmic dust — sometimes even invisible, since an insufficient number of electrically charged atoms are not found among them. The unexpected performances of the recent nova in Perseus (February 21 and 22, 1901) seem to have supplied corroborative testimony. Astronomers everywhere speak of the occurrence of inevitable collisions, the effect of which is that dead stars burst into flame, or even that nebulæ are reconstituted in every stage of evolution. No one can deny that the different aspects of the phenomenon present a remarkable succession of analogies which some day perhaps will permit the provisional outline of the cyclical course of astral transformation, of which our earth represents a passing phase in infinite space and time.

That is why the astronomers pay particular attention to the famous spiral movements which have been pointed out and which have received due comment in the case of an

ever-increasing number of important nebulæ. Photographs of spiral nebulæ, among which Canes Venatici stands out, seem to prove the attributed motion beyond doubt. And when we come to the annular nebulæ, like that of the Lyre near Saturn, the evidence from analogy becomes so convincing that the thrill of victory cannot be repressed. The nebular belts of the Pleiades, the nebular trail of Cygnus — so remarkably significant — the nebula of the Black Hole in the Milky Way, the great nebula of Serpentarius, and the star clusters of Hercules, of Pegasus, and of Gemini show us in their diversified forms the spiroidal shape about to break up in order to give place to new evolutionary states, whereas the novæ, with their rapidly changing phases, suggest collisions, the conditions of which vary constantly.

Variable stars and gaseous nebulæ still indicate insufficiently defined stages, and the study of their spectra brings new complications which later may take the shape of new floods of information. All that we dare say, at present, is that correlations of the changes of aspect seem to suggest series of periods yet to be explained. Every category of stars — and there are many categories — has an hypothetical history, the possibilities of which help us to form a general conception out of the hints we have derived from the spectroscope, and which suggest a law of evolutionary phases. It is hardly necessary to add that the agglomerations of helium and of hydrogen in the stellar atmosphere introduce their contingent of phenomena just as carbon and its chemical combinations do when the lowering of the temperature allows them to enter into play.

I fully recognize that all this is a great jumble of more or less coherent hypotheses awaiting the corrective touch of verification. Nevertheless, in it there are innumerable suggestive observations, and it would be bad form even for those persons who laboriously try to stand on the puerilities of Moses to contest the fact. For a correct understanding of the efforts of science I refer the reader to Poincaré's studies on cosmogonical hypotheses. My intention here is simply to set down the harmonious state of scientific thought, in

order to contrast it with the primitive fancies to which, against the evidence of verified observation, ancestral tradition would bind us.

SYNTHESIS OF FRAGMENTS

Laplace, struck with the fact that the motion of the planets round the sun and the motion of the sun as it revolves on its axis are in the same direction and almost on the same plane, drew from it his hypothesis of a central axis, enveloped in a substance continuous to a point beyond the orbit of the most remote planet. The existence of a kernel around which condensation can take place strongly supports the idea. If this theory be accepted, the diffuse nebula, perhaps preceded by the invisible nebula, may, through condensation, have been the first stage of evolution. 'The principal point of the doctrine,' this scientist observes, 'is the strict agreement of the results with the phenomena.' As a matter of fact, that characteristic is decisive; no theory can hold against it. The whole problem of the scientific hypotheses which are to follow is to know where, when, and how that requisite is solidly established.

When 'retrograde motion' was recognized in the rotation and in the translation of certain stars, the foundations of Laplace's theory seemed gravely threatened. Later discoveries resolved all difficulties. If Laplace had known of retrograde rotation, he would perhaps have been greatly perplexed up to the time when the discovery of Neptune and of Uranus adequately explained the situation. The spiral nebulæ would also have disconcerted him, perhaps, and his bold hypothesis would have had to await a more propitious day. How eagerly scientific knowledge, with its inevitable weak spots, invites criticism, and how far it is from fearing it! By the aid of such criticism, Laplace definitively founded the scientific cosmogony. On the other hand, the cosmogonies of revelation have been unable to survive the progress of systematic thought.

A knowledge of spiral nebulæ would no doubt have opened new horizons to Laplace. In the common and in

the divergent aspects of the nebulæ, theory and calculation have a vast field in which to work. Scientific knowledge, which has enabled us to penetrate ever deeper into the relations of phenomena, has made it possible for a mediocre pupil in our grammar schools to succeed in knowing, sometimes in spite of himself, relations of which Aristotle, Pico della Mirandola, and, as the Hindu suggests, perhaps even that very god to whom fell the task of creation were ignorant.

In contrast, although we have a scientific hypothesis covering the formation of our solar system, the relatively easy problem of the combustion of the sun continues unsolved, even though the sun be the source of our life. What maintains the solar fire, and on what basis can we estimate its duration? That point is not yet sufficiently clear. If the hypothesis of Laplace could to a considerable extent 'reconcile phenomena with results,' our doubtful explanations of the solar conflagration have generally been founded on nothing better than suggested theories. Worthy Prometheus, who in the hollow of his rod brought the needed testimony in the form of a live coal, kept the secret of the precious but frail star on which our destiny depends.

In any event, it is decidedly to be feared that our time for wondering about ourselves is necessarily limited. I see nothing for it but to accept the disadvantages as well as the advantages of solar evolution. The heat of the central fires is, we are assured, from six to seven thousand degrees, and that heat decreases by approximately one and four tenths degrees every year. The figures are not encouraging. What good are a few miserable centuries! For such a small matter, the worthy inhabitants of the invisible planets temporarily gravitating around known and unknown stars do not trouble to make enough noise so that any of it reaches us. Even if unforeseen phenomena should procure us a reprieve at the threshold of the inevitable, let us bear ourselves with dignity.

Amended or not by Einstein, the magnificent work of Newton represents an essay in cosmology, the needless

proof of which was supplied when Bouvard, Adams, and later Leverrier, in order to explain the irregularity in the motion of Uranus, suggested the hypothesis of a disturbing planet, the position of which they sought to determine without ever having observed it. Before long the discovery of Neptune was the only remaining task, and that was soon done. The evidence was conclusive!

The disparity between man and his cosmic frame is beyond the range of the emotions of which we can dispose. The sun is one million two hundred thousand times greater than the earth. The star Betelgeuse, already referred to, has a diameter three hundred times larger than the diameter of the sun. The earth, distant thirty-six million leagues from the sun, transports its passengers at a speed of more than one hundred thousand kilometers an hour. Neptune is eleven hundred million leagues away. The figures serve merely as isolated points of comparison in respect to stellar distances. Even as far away as Neptune; that is, at more than a thousand millions of leagues from the sun, gravitation still exercises its power in space, as, doubtless, it exercises it everywhere else. But how can we visualize that 'everywhere else'?

What part do man and the constituents of his life play in that beyond toward which his fancies take their impotent flight? What are all the magnificences of the Bible when compared with our positive fragment of infinity? When the God of Moses bethought him of creating the universe, what an odd plan it was to begin with the smallest planet and make it the center of his creation! Our bards, lost in the hallucinations of mental darkness, could write their poems only within the limitations of human dreamers sunk in the ignorance of their age. That is why we fail to understand them when we try to share in their emotions. The pontiff cares not at all for such considerations, for he influences the deep souls of the simple less by the commonplace monotony of his preaching than by the external trappings of the pageantry of his rites and by the hieratic hymns that impress the crowd only because it does not understand

them. When we shall have risen to the high emotion of reality, we shall have turned science into a higher poetry, and, belatedly perhaps, we shall be worthy of the rank to which we lay claim. Then at last we shall realize that we must know in order to live, and that we must live in order to idealize, that is, to try to rise above life.

When photographs of the heavens, taken throughout a sufficient number of centuries, can be compared with those that we are taking to-day, the changes of the firmament will begin to be clear. Stellar systems, globular clusters, star-clusters, and open clusters, contain myriads of stars which are suns with or without a train of planets, and beside which our sun is an atom. There are nebulæ resolvable into stars, or, indeed, into luminous gas in the bosom of which fairy-like transformations take place. The picture defies every attempt at even the most summary description. Thirty thousand stars of the twenty-first magnitude have been counted in a single globular cluster. The cluster of Hercules is thirty thousand 'light-years' [1] distant from us, and its mass is perhaps as great as that of a hundred thousand suns.

How baffling it is to think that a star now in plain sight 'may have disappeared,' Nordman [2] writes, 'three hundred and sixty centuries ago without our knowing anything about it!' A universe, or simply a planet, may have ceased to exist since the rays of its light started on their way toward our imperceptible earth! What comment can we make when told of a star, the light of which has required two hundred and seventeen thousand years to come to us? [3]

[1] A 'light-year' designates the distance traveled by light in the course of a year, say nine and a half trillions of kilometers.

[2] *Le Royaume des cieux.*

[3] Nordman is delighted with the idea that the light which reaches us to-day from the nebula of Andromeda started before the first pleistocene glacial period. Consequently, if he stood in the right place a man with a suitable telescope could *to-day* watch the original formation of the terrestrial sediments, and the development of all that has followed it. Traveling at the rate of three hundred thousand kilometers a second, light needs at least thirty thousand years to traverse the Milky Way, which, some persons dare maintain, contains hundreds of millions of suns. We are told that it would take the same light nine

The exact niceties of our knowledge, when carried beyond the scope of our mental capacities, confuse our relative minds. To wonder is merely an emotion caused by lack of adaptability.

I have spoken of the spiral nebulæ, the number of which no one dares compute, and each one of which is composed of millions of stars, whose light requires millions of years to reach us, and I have mentioned the comparisons which they suggest with our Milky Way.[1] What a seething mass of stars in different phases of evolution into solar systems wherein life and thought will be organized and developed! We have at most caught an imperfect glimpse of the phenomena of extreme expansion through the radiation that lowers the temperature, and then of the phenomena of condensation that results from the mutual attraction of gaseous particles. The star grows hot in proportion to its condensation. The development of its phases is open to every hypothesis. There are so many stars that their collisions, which destroy and create universes, become permanent elements in the picture.

By revealing identical diversity in identical combinations, the spectroscope shows us that the chemical state, and consequently the atomic structure, are the same in every part of the universe. I have mentioned that Lockyer discovered helium in the sun twenty-six years before we found it on the earth, whereas coronium, found in the corona of the sun, and nebulium, one of the gases in the nebulæ, have not yet been discovered on our planet.

The nearest star (Proxima) is ten thousand times farther away from the earth than is Neptune; Sirius is distant twenty-three trillions of leagues, and the North Star is eighty-six trillions, that is, eighty-six thousand billions of leagues distant. All those suns, and all those universes are engaged in complexities of motion that confuse us. And

hundred million years to make the round trip of a 'universe' consisting only of the Milky Way and its dependencies. And what, pray, of all that lies beyond it?

[1] We know that our sun, as well as all the other stars which we can see with the naked eye, are part of the Milky Way.

there is our maddening Milky Way with its suns, which were long estimated at not more than a million, but of which, to-day, there are said to be hundreds of millions. And there are other milky ways scattered everywhere to the extreme limit of human vision. What lies beyond that limit, we do not dare question inductively. Meanwhile, the spectroscope answers our questions about the stars and reveals the uniformity of a universe in which stars at every stage of evolution continue to tell throughout space the history of a series of events from which springs the phenomenon of life and therefore the phenomenon of the consciousness of the Cosmos. Thus, there are scales of life which we must recognize if we are to feel that we occupy our ordained place in a synthesis of things the bounds of which recede as we advance.

To be sure, we can observe phenomena, describe them and tabulate them. But in order to sense them in their unity and from our place in the fellowship of energies to embody them in our emotional life, do we not need the full adaptation of man to the universe? And that adaptation is difficult when one partner has infinity for an attribute.

We cannot resist making an obstinate attempt to know the sensation of a whole which synthesizes the fragments of knowledge. After so many misconceptions, we have as yet only felt the first thrills of reality. Out of harmony with the cosmic energies, we have been able to give nothing but a proof of our impotence. In harmony with them, we shall perhaps in the end be accorded the boon of vibrating in unison with the elements. To know in order to dream, after having dreamed in order to know — that is a psychological progress, as a result of which the two mental procedures become supplementary rather than discordant. Then only shall we be able to live to the height of our mental capacity in the sovereign emotion that assails us before the dazzling sensation of immensity. The dead or dying gods gave us in their youth the illusion of that supreme enjoyment. Now we need a universe about to be known and realized by man,

in order to give us an idealism that this time is of a scientific kind and proper to super-men.

TO COÖRDINATE MAN IN A COÖRDINATE WORLD

However the sun may renew itself, its fate is necessarily fixed in advance, and ours with it. Athwart passing phenomena that are of equal value in the illimitable universe, amid the tempest of things, the drama of our life is being played, although to us it is imperceptible in the flow of the cycles in which the milky ways unfold. It is a dazzling test for the diverse elements of our sensibility.

The more sharply the disparity between the nothingness of our personality and the overwhelming forms of infinity that it confronts is defined, the more the intellect of man, himself less than little in the shoreless ocean of the Cosmos, stands out magnificently clear and sharp in high relief. If the galactic universe that, in the eternal course of evolution, the atom with its electrons may again unite with — although neither universe nor atom is the limit of anything — is beyond human measurement, we, by the intimate thrill of consciousness, are glorified with an aureole of sensation so brilliant as to justify an exalted pride in it.

True, all that is no sooner begun than ended. It is like the hours we spend in our theaters, in search of emotions to enhance the agitation of our lives, without regretting that we have to leave the bright fictions of the stage for the peaceful reality of sleep. Then why lament when we have the opportunity of taking part in the greatest of all conceivable dramas — the drama of the infinite? Whether the play of solar contraction or dispersion, or of some other agency yet to be recognized, shall prolong for millions of years the existence of the sun (already myriads of years old); whether the planetary masses shall rush one upon another; whether our end shall come from heat or from cold, are matters necessarily secondary to the wonders of life. We even lack time for the childish pleasure of complaining.

What avails the marvelous unity between the organism that thinks and the universe revealed by thought, both

the result of the no less marvelous adjustment of the evolutionary energy common to both? We can record phenomena, and we can express them in figures; we can classify them and arrange them in their sequence so that we may try to understand them and adapt ourselves to them. But how can our life be real amid the forms of the inevitable whole if we decline to do what is necessary to bring ourselves into harmony with what is immediately about us?

What does it mean to coördinate man in a coördinate world if not that man, a phenomenon of the universe, must evolve in his natural organic relations with the evolution of the universe of which he is the product? To develop according to his own law, which necessarily accords with the laws of which he is the effect, is for him the beginning and the end of his problem. The man who is rightly coördinated — that is, who is in the right sequence of organic evolution — cannot help but enter into the right sequence of the universal evolution that begot him. And, in order to know his exact position and thus to realize the natural conditions of his existence, how can he do otherwise than first know his dwelling-place from the prints of his two feet upon the planet even to the translucent gleams of the remotest nebula — and then feel the temptation to know what may be beyond?

The various forms of evolution on his earth will prescribe the conditions of his own existence, and when he shall have determined the course of his development within the organic conditions of his personality, he will have found out by exercising his faculties how to give them their legitimate direction. He will have made his choice between the too easily explicable misconceptions, the vaporous cloud-shapes of primitive days and the firm edifice of tested science.

Only then, in full possession of his own personality, will he figure as a finished man, capable of dismissing the presumptuous guides who led him astray amid the bypaths of delusion and of taking into his own resolute hands the reins of his destiny. Were his bonds not those of atavism, the

effort would be all the easier, because ever since man's appearance on the earth the general tendency both of his personal and of his social life has not varied. He has spontaneously advised being sincere, just, good, pitiful, and his troubles have come solely from the fact that he has been none of those things. We might talk less if we did more. The best sermon would be preached by example. We need not fear that all divergence will end. There will always remain plenty of points on which to differ.

When the correct evolution of man, too long threatened by the invasion of illogical myths, at last finds its action restored to equilibrium through contact with reality, humanity, won over to right methods of thinking, will see the worst and most ancient obstacles removed from its path. Then an ordered humanity will indeed have been born. Man will have created himself. He will begin truly to be. He will be. He will have been.

To abandon ourselves to the sophistries of the fictions of a vision of servitude under irresponsible gods is a quite different affair. As our ignorance that our will is not free[1] gives us the sense of personal power in guiding our own evolution, including even the contingent possibility of concluding it with suicide, which is the last word of our 'will,' we can at least demand of ourselves the organic exertion of those energies which for good or evil settle the account of our destiny.

Alas, it is only too easy to manufacture gods by the hundred and magically to confer upon them that universal power under which the last remnant of human dignity falls to ruin in its slavish relation to the absolute. As the sculptor of the legend exclaimed in wonder over his statue, we exclaim over the fabrications of theology. How can we comprehend the incomprehensible, or admire and 'love' what escapes our senses? We truly admire the universe when it yields to our penetrating analyses and to our partial syntheses, and then rewards us with lightning flashes of reality. Not until radium was discovered could we be daz-

[1] Cf. Chapter II, the section dealing with free will.

zled by the atom. To adore your God as the support of a realm of inscrutable relationships is only a blind ecstasy.

Abasing yourself before an absolute autocracy and 'obeying universal laws in order to be obeyed by them' are two mutually exclusive attitudes, since they imply a constant contradiction in thought and in deed — and, therefore, in ideals. An empty dream may have the charm of the stupor that opiates produce. To know in order to be worthy to live in the fullest possible degree is the lot of evolving man. We cannot condemn ourselves to an artificial paradise without incurring every disappointment of the road. The austerity of 'knowledge' may, it is true, discourage the weak. But we have desired knowledge, and he who has stretched forth his hand toward the fruit of the Tree of Knowledge wants, as long as he lives, to pluck it again and always. No effort and no threat of a wrathful god will serve to restrain him. Undoubtedly the inexpressible extent of the visible world and the severe limitations of the rôle to which he finds himself confined disconcert him. But does not the marvelous reaction of consciousness to the tumults of the fathomless gulf of things bring us at least the splendid sensation of personal power, even in the midst of the incalculable decisions of fate? Do we not owe to the illusion of 'free-will' personifications that, like a moving-picture film, do not harmonize with actualities? Is not that pretty much what happens to us at the theater, the illusion of which allows us unconsciously to enter so fully into the characters that, transferring their joys and sorrows to ourselves, we laugh or weep? Thrust into the very heart of the cosmic adventure, we face the problem of winning the proud happiness that comes of gaining more and more insight into the shifting realities of the universe — a fine task for any man worthy to take an active part therein.

Our first ancestors lived chiefly through a sort of vegetative strength. Our ancestors of the succeeding centuries advanced the common effort at interpretation, either chimerical or partly verified, in a varying degree, according to the measure of their knowledge. And, behold, in the course of

our continuous effort to know — phenomenon of capital importance in the history of things — we have gained the ability to establish a mean of positive knowledge that definitively puts us in a position to pass from a life of hallucination to the conscious task of bringing human collaboration to the aid of the elemental factors of the universe.

Renan, carefully divorcing himself from his theology, gave it as his opinion that, seen from Sirius, man with 'his works and days,' if measured according to the scale of the revolutions of the universe, cuts a very small figure indeed. In fact, the achievement of humanity, when regarded solely from Sirius, seems to have no appreciable importance in infinity. Whether we regard the universe as infinite, or hold with Einstein to the conception that the universe is 'finite but unlimited,' the phenomenon of man, beside which the very splendors of the Cosmos pale, requires the development of a conscious energy if it is to face the varying attacks of the unknown. Unmerited good fortune has made us what we are. The universe is an abiding-place such that no one could want any other. What a wonderful destiny if it should fall to us, if only for a day, to perfect it with the knowledge of itself!

After all, of what interest can be the measurement of the incommensurable, or the proportions of the microcosm or the macrocosm in which we are lost to view? Since we are particles of the infinite, the slightest alteration, no matter how remote, in the huge adventure of the universe can have its reaction in us. Our satellite, for example, by increasing little by little its distance from the earth foretells changes in the dim future which cannot fail to have an important influence on our lives. I cite that small fact, which may seem insignificant, but which in the long run will nevertheless make itself felt through its unexpected effects. In the inexpressible complexity of the Cosmos what surprises may not await us? Of what weight in the accounting of the infinite are the twelve thousand kilometers of the diameter of the earth when compared with the million two hundred thousand kilometers of the diameter of the sun, and

with the six hundred and forty millions of the diameter of Antares — not to speak of all the other appalling measurements to which we can bring no yardstick that will mark their relative proportions to the minute but great phenomena of our own feeling, thinking, and expressing?

However, we gain the courage to look squarely in the face prodigies that are no prodigies except in relation to our personality, from which the gauge of cosmic dimensions seems to have been omitted. We are ourselves, and during the hour that is ours we try to live at the highest level of our faculties. Is it not time to open our eyes and wonder about something in ourselves other than size and duration? If in virtue of a fantastic dilation of ether Antares were to fill unlimited time and space, it would surprise me no more than do the sparkles of the flaming atom. On the other hand, the progressive transition from mineral life to the evolution of consciousness in the series of organic life is a world event worthy to make us pause in the midst of our enthusiastic investigations. That 'miracle of miracles' exists in us. Bearers of the eternal torch, we carry it through space and time with justifiable pride. What better fortune could we ask than to show ourselves worthy of the task of partially realizing the ideal which permits us to live and even to grow through a continuous effort to know and to feel? By way of contrast, consider the impotence of the theological threats which forbid us access to scientific knowledge under a penalty of death imposed in the name of the Divinity.

Our imprescriptible victory will undoubtedly be short-lived. But, since it extends through the unending evolution of the immeasurable universe, are not the transient moments that follow one another in eternal relays tantamount to perpetuity?[1] Everything consists merely of ephemeral changes of position. However, enough dots make

[1] I express no opinion on the perpetuity of phenomena, based on the famous hypothesis that everything eternally returns to its starting-point, whether or not buttressed with the hypothesis of panspermy, which seems to me dubious. On the general aspects of the problem the reader can profitably consult *l'Éternité par les astres*, by Auguste Planqui.

an unending line. Whether we speak of the revolutions of nebulæ or of atoms makes no difference, since the phenomena — because their laws are constant — are the same in kind, in procedure, and in effect. It has become a commonplace to compare the atomic to the stellar universe. A comparison between the cosmic distances and the intra-atomic distances, between the nucleus and the electron is inevitable. The atom is a solar system; such is, up to the present moment, the generally accepted formula.

The burning question of the day, which makes the physicists turn to philosophy and the philosophers to physics, is that of knowing whether, according to the famous principle of Carnot — amended by Clausius — we have determined the point at which 'atomic energy seems to be dissipated.' Because we have not yet found any trace of its path, does it necessarily follow that it has 'disappeared,' as men of science do not hesitate to affirm? That would be the ultimate 'degradation of energy' by means of 'entropy' — though no one can tell us what entropy is, or what it could be, if it were anything but a word.

There is no term less scientific than 'disappearance,' unless it be 'creation.' The old theory of phenomena was that 'nothing is created and nothing disappears.' No verbal fireworks will dislodge us from a strong position which consists in observing what the facts actually are. I shall deal with the topic again when I discuss the atom. All that I intend to say at present is that in the infinite duration of the universe the equalization of temperature through radiation — thermic death — would have taken place long since, had the last word rested with 'the degradation of energy.' Having almost deified energy, how can our great physicists make up their minds to degrade it? I hope they will not offend the good will of a public which even theology has been unable to discourage.

Around us as well as within us we observe only a continuous exchange of energy between the different systems that go to make up the Cosmos. How can we comprehend a thermic death based on the ceasing of all transformations

of energy? Such a conclusion assumes that the infinite universe is an isolated system. The hypothesis is audacious, if we admit that it means anything at all.

Fortunately, men of science, forced by facts somewhat to modify the principle, no longer recognize in it any other value than a statistical one. The system evolves in a fixed direction that for the present we may regard as inadequately known. 'The most important consequence of the fact,' remarks Langevin on this point, 'is perhaps that the configuration of equilibrium forecast by thermodynamics, namely, the configuration of maximum entropy, now seems to us, not the only possible form for the whole, but the most probable. . . .[1] Carnot's theory thus loses its claim to finality; the forms of equilibrium which it allows us to forecast, and which it represents as inflexible, actually correspond only to an average condition around which matter is in continual vibration.' [2]

Thus we can grasp something of the evolution of the world without giving up some chance hope of contacts which will allow the universe to continue. This point is not without its value.

For the sake of completeness, I should mention here the theory of relativity by which Einstein has made possible a conception of the world that surpasses Newton's. Einstein's relativity does not permit the stable point implied by the genius who boasted that he set up no hypotheses. The subject is not one that can be summarized; Einstein brings nothing less than a revolution of space and time — an undertaking on which I should not care to embark even if I could. However the Newtonian conception may be expanded, it will nevertheless continue to supply us with the principal information about the mechanism of the world, while we await the corrections and adjustments of the future.

[1] That is, in the mathematical sense of the word.

[2] Langevin, *La Physique depuis vingt ans.*

MAN IN TERMS OF HIS COSMOLOGY

Man is determined by the facts of his cosmology. Since the eternal Cosmos consists of nothing except unending transformations, the old word 'cosmogony,' which seems to assume a begetting by a father unknown, presupposes the idea of a creative fabrication such as was accepted before the notion of a 'consecutive cosmology' — tardy fruit of observation — developed. As a matter of fact, there is no 'cosmogony,' for we have discovered no trace of a cause that was not itself the result of antecedent causes. The well-known serpent that bites its tail would be a perfect symbol of things, provided it were well understood that he never would or could unlock his jaws. All we need do is accept phenomena, no matter at what point, in the order in which they happen to present themselves.

From our imaginative cosmogonies there can be deduced a human development in harmony with the frame in which man had set himself. In representing him as the masterpiece of God, his creator, Revelation implicitly endowed him with a knowledge almost equal to that of the Divinity. However, to fulfill a destiny of mere obedience, man need not know what he does. Consequently, the first sin of the first man lay precisely in having wished to know through the resources of his own mind. Any cosmology, however put together, will reflect the human organism which conceived it with the special aim of giving itself the highest place in it. 'Blessed are the poor in spirit,' [1] was the inevitable formula of the first theo-cosmologies.

However, is not the first need which calls forth personal action the need to know, that we may so order ourselves, and so will and act as to be in full accord with the activities of the universe? To live like men under the infinite vault after having known, spoken, and willed in human fashion — is not that the mark we shoot at, whether at short or long range? Why should we give up what is most vital and finest in ourselves in order to spend our lives, as Pascal would have us spend them, solely in the anticipation of death?

[1] Is not that Pascal's formula: 'Humble yourselves'?

Man is made up of mingled strength and weakness. If he is to separate himself into his actual components, he must, as Delphi demanded, know himself. But he can know himself only in his proper place in the universe as determined by the conditions of his earthly life, and not by proclaiming himself superhuman because he prefers the indolence of dreaming to the labor of determining facts. Are we to be men or mere shadows? Ours is the privilege of choosing our destiny.

What we have sought in our cosmogonies and what we have put into them is really a fictitious representation of ourselves rather than a bold proclamation of objective truth. We have wished a universe made for man, whereas we should have inferred the nature of man from the universe that formed him. Since we were ignorant of the interdependence of phenomena, an imaginative synthesis was bound to precede in our minds the knowledge derived from science. To-day, owing to the progress of evolution, a process of experiment is collecting the materials for an analysis of the Cosmos that will enable us to set up a synthesis of its coördinations which will include the realization of thinking man. Obviously, men of imagination will mourn in advance the loss of the insipid pleasures of dreams made to order. But let us be patient. Experimental science has awakened sensations of grandeur which the primitive poverty of our knowledge could not be privileged to feel. To attain to ever-higher satisfactions, we need but attach ourselves stubbornly to the disinterested rigors of our duty toward ourselves, which is realized through our duty toward others. People do not realize clearly enough that a superior unselfishness affords a more refined contentment than does the most cleverly disguised self-seeking.

Amid the accidents of the universe, we are distinguished from each other by the way in which we react to the contacts of the exterior world. Shall we react weakly or powerfully? That is the whole problem. The inertia of misconception may have the very mediocre charm of a state bordering on the animal. The noble impulse of self-denial requires

a greater effort. The believer, who cannot rise above the mental state of continuous subjection, sees himself reduced to the sole resource of wearying the unknown with supplications and with egotistic bargaining as disgraceful to himself as to his divinity. We must choose between necessary submission and attempted action.

Everything, however, solicits minds capable of assimilating the shifting relations of the coördinated elements. Strong and capable minds will have enough to occupy them in forming and developing their lives otherwise than those of their companions in life. Amid the universal rivalry can we not each take refuge in impersonality? Why should devotion continually dash itself against the foolish resistance of creatures dazed by misconception — as the life-saver sometimes has to struggle against the frenzy of a drowning man?

In spite of everything, nothing will prevent the slow evolution of intelligence and of character. The chosen few will not flinch in their obstinate resolution to know, but will gather for the effort, even when that effort is scoffed at, all those energies which are above recompense, whether of this world or of the other. Call the efforts by whatever name you will, all the rest is not worthy of mention.

Feeble creatures, content with verbal adherence to dogmatic formulæ independently of any personal mental reaction, seek only the favor of the rabble and that mask of 'honors' which ill disguises the surrender of conscience. Impassive, the solitary thinker repudiates that which ignorance recommends and wishes to push his investigation of the world and of himself in every direction. If I must resign myself to the disgraceful fact that, in spite of specious laws, many of our French people even to-day cannot read, how can I feel astonished at the great number of people who put forth their greatest effort in order to place intelligence under the dominion of ignorance rather than of knowledge. Aided by incommensurable time, let us have recourse to the thankless task of comprehension.

I wish I might reproduce the simple, moving pages in

which our men of science set forth those general laws of cosmic activity which govern the relations between star and star, molecule and molecule, and atom and atom. You can take your fill of wonder over the mistake of those unfortunate persons who in their ignorance complain that science extinguishes poetry — as if imagination could find anything more marvelous than the universe in its reality!

People admire the declaration of Jahveh, taken from Brahma, 'I am He Who is.' The more philosophic atom says nothing, yet could say as much. The eminent superiority of the atom lies in the fact that we can define it, whereas divinity refuses us that satisfaction. We have not reached, and we shall never reach, the ultimate end of things, for the simple reason that the term is meaningless. But there are such interesting sights to be seen along the path to school that we enjoy learning even before we begin the formal lesson. Are we not more deeply stirred by the prodigal universe than by childish ecclesiastical imagery offered to unfortunate believers to elevate their souls?

Under the open sky, thought progresses by insensible advances toward a fresh crop of problems which make us question the elements of the world, which is slow to return us positive answers. A new power has been born; it demands an accounting of the Cosmos and obtains it. He who wonders finds what he seeks. If we want drama and poetry which is lived, they are not grudged us. Who would dare bring our puerile myths face to face with the marvelous prodigies before which imagination staggers in the blaze of reality? Behold Hanuman, the simian magician of the 'Ramayana,' transporting mountains with their forests and their floods, so that skilled eyes may find on them the herb that will heal his prince; the Combats of the Titans; Hercules and his labors; Minerva springing from the head of Jove; Vulcan thrown from Mount Olympus; Mars and Venus caught under a net of golden meshes; a God who, to save us from his own harshness, has to be sacrificed by criminals whom he made criminal, and who are to be eternally damned for their obedience to him — what are all

those childish tales in comparison with the enchantments of the universe, with their alternating unconsciousness and higher consciousness, that are beyond the grasp of the most highly stimulated imagination?

To maintain that those spectacles are the work of an 'Eternal Being,' himself the result of nothing, shifts the question without answering it, since at best it is only a matter of noting an autonomy and of ascertaining whether or not it has a personality. Why did not God make his Revelations agree with the facts of the universe instead of letting us successively wander from one mistake to another? When we tried to learn, why, instead of helping us, could he find nothing better than tortures to turn us from the attempt? Why did he have the revolution of the planets of which he was the author denied and officially condemned by the direct agents of his Divinity?

And what about evil? Unquestionably the divine conscience brought it of its own free will upon the earth. That does not seem to me any reason why we should lose ourselves in thanks. If man is imperfect, why was he not made better? Why should there be so much atrocious suffering? There are too many 'whys' that bring discredit on the decidedly ill-managed work of an 'Almighty' who creates man on purpose to make him fall, and who punishes him for submitting to the law that he himself imposed on him.

Nevertheless, in the hereditary pain of his inadequacy and in the dazzling hopes which may or may not be realized, thinking man, or, rather, the man destined to think, ultimately appeared. Amid the universal turmoil of all the activities of the elements, alone against the world, he lived on deceptive dreams until philosophy was born. The earth, with its caverns in which still lurked the savage beast, and with its icy cold or torrid heat, although it was to be his friend, was at first his enemy. For companions he had the winds, the water that the sky sent down to him, the snow, the hurricanes, maladies, perpetual cataclysms, the tree that along with nourishment offered him the poison of its fruit, and the famished carnivorous beast. Such was man, poorly

equipped for his own defense, ready to feast upon his brother, and with nothing except the law of reprisal to deter him. Everything is balanced, everything is paid for. Our woes are the counterpart of our joys. At best, life is the implacable law which requires us to atone for our emotional pleasures. It is a series of favors diversely felt and diversely paid for.

It took primitive man a long time to understand what was happening to him. Habits, inherited from his animal ancestors, were bound to make his beginnings easy. Century after century was to elapse during which, with only a subconscious knowledge of things, he was to live in a tumult of misinterpreted sensations. He was allowed — as are we also — to err complacently. He had only the crudest directions as to the road he must take to reach organized and civilized society. What confused and tenacious obscurity he had to pass through before he could even recognize the actual conditions of human life! But all at once the courage was given him to trust his destiny in spite of everything. A new stage in human life was reached when the urgent desire for knowledge was felt. It was a decisive stage for it brought us to a condition of willing and acting, begun in pain and leading to a destination of which we were childishly afraid.

Man has labored. Man has suffered. In meditative hours he can now balance his intellectual accounts. He will not prove false to himself. The hour of virile intelligence is come — virile before men, virile before things, virile before his dying gods. With throbbing heart and head held high, he will tremble neither at the block nor at the stake — any more than at the thunderous decree from on high. The sincere will to know is incompatible with fear, as is proved by the martyrs of every opinion and of every faith. Death is no more than a serene night, completely free from the nightmares of life.

Man is the sole creature who can put that life to use. However he may die, he has lived. He lives, he wishes to live, and evil and good counterbalance each other. He

emerges from a night of unconsciousness to the dazzling knowledge of sensations of things. He will refine them by the alchemy of his understanding, and of them he will compose a rich idealism that would make him the equal of the gods, did not the pangs of following out his own destiny already make him superior to them.

Can any one maintain that in all this there is not the possibility of a beautiful poetry, of a drama of feelings so appealing that it richly recompenses man for ills which rites, prayers, and sorcery cannot conjure away? Good and evil last but for a time, since they wear away of themselves. Life tries to prolong and renew man's pleasures; it sends his sorrows to Lethe.

Compare the large cosmic rhythm of our poetry of the active universe with the pompous monotony of the Psalmist, wearying his 'Lord' with his flatteries. La Fontaine tells us that every flatterer lives at the cost of the man who listens to him. Was it in that you put your hope, O holy King David? When Boileau sang the 'heroism' of his king theatrically crossing the Rhine, he had the excuse of having in Louis XIV a patron blind enough to cherish illusions about himself. What must God's sensations be when man talks to him of his 'exaltation,' of his 'glory,' since in his own eyes he cannot be exalted, or glorified, or even simply magnified? He is the Almighty Absolute, and to win his favors men talk to him of his 'power.' How can that affect him? Can they not assume that he knows himself? Are you, then, so quickly out of breath, O Poet-King? How far above yours are our simple human hearts when we turn aside from the base service of flattery of which you, in turn flatterer and flattered, have known the humiliation, whereas we, in complete self-forgetfulness, attain the noblest emotion of the humanity of the universe!

END OF VOLUME I