

# CREATIVE EVOLUTION

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Modern, like ancient, science proceeds according to the cinematographical method. It cannot do otherwise; all science is subject to this law. For it is of the essence of science to handle *signs*, which it substitutes for the objects themselves. These signs undoubtedly differ from those of language by their greater precision and their higher efficacy; they are none the less tied down to the general condition of the sign, which is to denote a fixed aspect of the reality under an arrested form. In order to think movement, a constantly renewed effort of the mind is necessary. Signs are made to dispense us with this effort by substituting, for the moving continuity of things, an artificial reconstruction which is its equivalent in practice and has the advantage of being easily handled. But let us leave aside the means and consider only the end. What is the essential object of science? It is to enlarge our influence over things. Science may be speculative in its form, disinterested in its immediate ends; in other words we may give it as long a credit as it wants. But, however long the day of reckoning may be put off, some time or other the payment must be made. It is always then, in short, practical utility that science has in view. Even

when it launches into theory, it is bound to adapt its behavior to the general form of practice. However high it may rise, it must be ready to fall back into the field of action, and at once to get on its feet. This would not be possible for it, if its rhythm differed absolutely from that of action itself. Now action, we have said, proceeds by leaps. To act is to re-adapt oneself. To know, that is to say, to foresee in order to act, is then to go from situation to situation, from arrangement to rearrangement. Science may consider rearrangements that come closer and closer to each other; it may thus increase the number of moments that it isolates, but it always isolates moments. As to what happens in the interval between the moments, science is no more concerned with that than are our common intelligence, our senses and our language: it does not bear on the interval, but only on the extremities. So the cinematographical method forces itself upon our science, as it did already on that of the ancients.

Wherein, then, is the difference between the two sciences? We indicated it when we said that the ancients reduced the physical order to the vital order, that is to say, laws to genera, while the moderns try to resolve genera into laws. But we have to look at it in another aspect, which, moreover, is only a transposition, of the first. Wherein consists the difference of attitude of the two sciences toward change? We may formulate it by saying that *ancient science thinks it knows its object sufficiently when it has noted of it some privileged moments, whereas modern science considers the object at any moment whatever.*

The forms or ideas of Plato or of Aristotle correspond to privileged or salient moments in the history of things—those, in general, that have been fixed by language. They are supposed, like the childhood or the old age of a living being, to characterize a period of which they express the

quintessence, all the rest of this period being filled by the passage, of no interest in itself, from one form to another form. Take, for instance, a falling body. It was thought that we got near enough to the fact when we characterized it as a whole: it was a movement *downward*; it was the tendency toward a *centre*; it was the *natural* movement of a body which, separated from the earth to which it belonged, was now going to find its place again. They noted, then, the final term or culminating point (*τέλος, ἀκμή*) and set it up as the essential moment: this moment, that language has retained in order to express the whole of the fact, sufficed also for science to characterize it. In the physics of Aristotle, it is by the concepts "high" and "low," spontaneous displacement and forced displacement, own place and strange place, that the movement of a body shot into space or falling freely is defined. But Galileo thought there was no essential moment, no privileged instant. To study the falling body is to consider it at it matters not what moment in its course. The true science of gravity is that which will determine, for any moment of time whatever, the position of the body in space. For this, indeed, signs far more precise than those of language are required.

We may say, then, that our physics differs from that of the ancients chiefly in the indefinite breaking up of time. For the ancients, time comprises as many undivided periods as our natural perception and our language cut out in it successive facts, each presenting a kind of individuality. For that reason, each of these facts admits, in their view, of only a *total* definition or description. If, in describing it, we are led to distinguish phases in it, we have several facts instead of a single one, several undivided periods instead of a single period; but time is always supposed to be divided into determinate periods, and the mode of division to be forced on the mind by apparent crises of the real,

comparable to that of puberty, by the apparent release of a new form.—For a Kepler or a Galileo, on the contrary, time is not divided objectively in one way or another by the matter that fills it. It has no natural articulations. We can, we ought to, divide it as we please. All moments count. None of them has the right to set itself up as a moment that represents or dominates the others. And, consequently, we know a change only when we are able to determine what it is about at any one of its moments.

The difference is profound. In fact, in a certain aspect it is radical. But, from the point of view from which we are regarding it, it is a difference of degree rather than of kind. The human mind has passed from the first kind of knowledge to the second through gradual perfecting, simply by seeking a higher precision. There is the same relation between these two sciences as between the noting of the phases of a movement by the eye and the much more complete recording of these phases by instantaneous photography. It is the same cinematographical mechanism in both cases, but it reaches a precision in the second that it cannot have in the first. Of the gallop of a horse our eye perceives chiefly a characteristic, essential or rather schematic attitude, a form that appears to radiate over a whole period and so fill up a time of gallop. It is this attitude that sculpture has fixed on the frieze of the Parthenon. But instantaneous photography isolates any moment; it puts them all in the same rank, and thus the gallop of a horse spreads out for it into as many successive attitudes as it wishes, instead of massing itself into a single attitude, which is supposed to flash out in a privileged moment and to illuminate a whole period.

From this original difference flow all the others. A science that considers, one after the other, undivided periods of duration, sees nothing but phases succeeding phases,

forms replacing forms; it is content with a *qualitative* description of objects, which it likens to organized beings. But when we seek to know what happens within one of these periods, at any moment of time, we are aiming at something entirely different. The changes which are produced from one moment to another are no longer, by the hypothesis, changes of quality; they are *quantitative* variations, it may be of the phenomenon itself, it may be of its elementary parts. We were right then to say that modern science is distinguishable from the ancient in that it applies to magnitudes and proposes first and foremost to measure them. The ancients did indeed try experiments, and on the other hand Kepler tried no experiment, in the proper sense of the word, in order to discover a law which is the very type of scientific knowledge as we understand it. What distinguishes modern science is not that it is experimental, but that it experiments and, more generally, works only with a view to measure.

For that reason it is right, again, to say that ancient science applied to *concepts*, while modern science seeks *laws*—constant relations between variable magnitudes. The concept of circularity was sufficient to Aristotle to define the movement of the heavenly bodies. But, even with the more accurate concept of elliptical form, Kepler did not think he had accounted for the movement of planets. He had to get a law, that is to say, a constant relation between the quantitative variations of two or several elements of the planetary movement.

Yet these are only consequences—differences that follow from the fundamental difference. It did happen to the ancients accidentally to experiment with a view to measuring, as also to discover a law expressing a constant relation between magnitudes. The principle of Archimedes is a true experimental law. It takes into account three variable

magnitudes: the volume of a body, the density of the liquid in which the body is immersed, the vertical pressure that is being exerted. And it states indeed that one of these three terms is a function of the other two.

The essential, original difference must therefore be sought elsewhere. It is the same that we noticed first. The science of the ancients is static. Either it considers in block the change that it studies, or, if it divides the change into periods, it makes of each of these periods a block in its turn: which amounts to saying that it takes no account of time. But modern science has been built up around the discoveries of Galileo and of Kepler, which immediately furnished it with a model. Now, what do the laws of Kepler say? They lay down a relation between the areas described by the heliocentric radius-vector of a planet and the *time* employed in describing them, a relation between the longer axis of the orbit and the *time* taken up by the course. And what was the principle discovered by Galileo? A law which connected the space traversed by a falling body with the *time* occupied by the fall. Furthermore, in what did the first of the great transformations of geometry in modern times consist, if not in introducing—in a veiled form, it is true—time and movement even in the consideration of figures? For the ancients, geometry was a purely static science. Figures were given to it at once, completely finished, like the Platonic Ideas. But the essence of the Cartesian geometry (although Descartes did not give it this form) was to regard every plane curve as described by the movement of a point on a movable straight line which is displaced, parallel to itself, along the axis of the abscissae—the displacement of the movable straight line being supposed to be uniform and the abscissa thus becoming representative of the time. The curve is then defined if we can state the relation connecting the space

traversed on the movable straight line to the time employed in traversing it, that is, if we are able to indicate the position of the movable point, on the straight line which it traverses, at any moment whatever of its course. This relation is just what we call the equation of the curve. To substitute an equation for a figure consists, therefore, in seeing the actual position of the moving points in the tracing of the curve at any moment whatever, instead of regarding this tracing all at once, gathered up in the unique moment when the curve has reached its finished state.

Such, then, was the directing idea of the reform by which both the science of nature and mathematics, which serves as its instrument, were renewed. Modern science is the daughter of astronomy; it has come down from heaven to earth along the inclined plane of Galileo, for it is through Galileo that Newton and his successors are connected with Kepler. Now, how did the astronomical problem present itself to Kepler? The question was, knowing the respective positions of the planets at a given moment, how to calculate their positions at any other moment. So the same question presented itself, henceforth, for every material system. Each material point became a rudimentary planet, and the main question, the ideal problem whose solution would yield the key to all the others was, the positions of these elements at a particular moment being given, how to determine their relative positions at any moment. No doubt the problem cannot be put in these precise terms except in very simple cases, for a schematized reality; for we never know the respective positions of the real elements of matter, supposing there are real elements; and, even if we knew them at a given moment, the calculation of their positions at another moment would generally require a mathematical effort surpassing human powers. But it is enough for us to know that these elements might be known,

that their present positions might be noted, and that a superhuman intellect might, by submitting these data to mathematical operations, determine the positions of the elements at any other moment of time. This conviction is at the bottom of the questions we put to ourselves on the subject of nature, and of the methods we employ to solve them. That is why every law in static form seems to us as a provisional instalment or as a particular view of a dynamic law which alone would give us whole and definitive knowledge.

Let us conclude, then, that our science is not only distinguished from ancient science in this, that it seeks laws, nor even in this, that its laws set forth relations between magnitudes: we must add that the magnitude to which we wish to be able to relate all others is time, and that *modern science must be defined pre-eminently by its aspiration to take time as an independent variable*. But with what time has it to do?

We have said before, and we cannot repeat too often, that the science of matter proceeds like ordinary knowledge. It perfects this knowledge, increases its precision and its scope, but it works in the same direction and puts the same mechanism into play. If, therefore, ordinary knowledge, by reason of the cinematographical mechanism to which it is subjected, forbears to follow becoming in so far as becoming is moving, the science of matter renounces it equally. No doubt, it distinguishes as great a number of moments as we wish in the interval of time it considers. However small the intervals may be at which it stops, it authorizes us to divide them again if necessary. In contrast with ancient science, which stopped at certain so-called essential moments, it is occupied indifferently with any moment whatever. But it always considers moments, always virtual stopping-places, always, in short, immobili-

ties. Which amounts to saying that real time, regarded as a flux, or, in other words, as the very mobility of being, escapes the hold of scientific knowledge. We have already tried to establish this point in a former work. We alluded to it again in the first chapter of this book. But it is necessary to revert to it once more, in order to clear up misunderstandings.

When positive science speaks of time, what it refers to is the movement of a certain mobile  $T$  on its trajectory. This movement has been chosen by it as representative of time, and it is, by definition, uniform. Let us call  $T_1, T_2, T_3, \dots$  etc., points which divide the trajectory of the mobile into equal parts from its origin  $T_0$ . We shall say that 1, 2, 3,  $\dots$  units of time have flowed past, when the mobile is at the points  $T_1, T_2, T_3, \dots$  of the line it traverses. Accordingly, to consider the state of the universe at the end of a certain time  $t$ , is to examine where it will be when  $T$  is at the point  $T_t$  of its course. But of the *flux* itself of time, still less of its effect on consciousness, there is here no question; for there enter into the calculation only the points  $T_1, T_2, T_3, \dots$  taken on the flux, never the flux itself. We may narrow the time considered as much as we will, that is, break up at will the interval between two consecutive divisions  $T_n$  and  $T_{n+1}$ ; but it is always with points, and with points only, that we are dealing. What we retain of the movement of the mobile  $T$  are positions taken on its trajectory. What we retain of all the other points of the universe are their positions on their respective trajectories. To each *virtual stop* of the moving body  $T$  at the points of division  $T_1, T_2, T_3, \dots$  we make correspond a *virtual stop* of all the other mobiles at the points where they are passing. And when we say that a movement or any other change has occupied a time  $t$ , we mean by it that we have noted a number  $t$  of corre-

spondences of this kind. We have therefore counted simultaneities; we have not concerned ourselves with the flux that goes from one to another. The proof of this is that I can, at discretion, vary the rapidity of the flux of the universe in regard to a consciousness that is independent of it and that would perceive the variation by the quite qualitative *feeling* that it would have of it: whatever the variation had been, since the movement of T would participate in this variation, I should have nothing to change in my equations nor in the numbers that figure in them.

Let us go further. Suppose that the rapidity of the flux becomes infinite. Imagine, as we said in the first pages of this book, that the trajectory of the mobile T is given at once, and that the whole history, past, present and future, of the material universe is spread out instantaneously in space. The same mathematical correspondences will subsist between the moments of the history of the world unfolded like a fan, so to speak, and the divisions  $T_1, T_2, T_3, \dots$  of the line which will be called, by definition, "the course of time." In the eyes of science nothing will have changed. But if, time thus spreading itself out in space and succession becoming juxtaposition, science has nothing to change in what it tells us, we must conclude that, in what it tells us, it takes account neither of *succession* in what of it is specific nor of *time* in what there is in it that is fluent. It has no sign to express what strikes our consciousness in succession and duration. It no more applies to becoming, so far as that is moving, than the bridges thrown here and there across the stream follow the water that flows under their arches.

Yet succession exists; I am conscious of it; it is a fact. When a physical process is going on before my eyes, my perception and my inclination have nothing to do with accelerating or retarding it. What is important to the

physicist is the *number* of units of duration the process fills; he does not concern himself about the units themselves and that is why the successive states of the world might be spread out all at once in space without his having to change anything in his science or to cease talking about time. But for us, conscious beings, it is the units that matter, for we do not count extremities of intervals, we feel and live the intervals themselves. Now, we are conscious of these intervals as of *definite* intervals. Let me come back again to the sugar in my glass of water: why must I wait for it to melt? While the duration of the phenomenon is *relative* for the physicist, since it is reduced to a certain number of units of time and the units themselves are indifferent, this duration is an *absolute* for my consciousness, for it coincides with a certain degree of impatience which is rigorously determined. Whence comes this determination? What is it that obliges me to wait, and to wait for a certain length of psychical duration which is forced upon me, over which I have no power? If succession, in so far as distinct from mere juxtaposition, has no real efficacy, if time is not a kind of force, why does the universe unfold its successive states with a velocity which, in regard to my consciousness, is a veritable absolute? Why with this particular velocity rather than any other? Why not with an infinite velocity? Why, in other words, is not everything given at once, as on the film of the cinematograph? The more I consider this point, the more it seems to me that, if the future is bound to *succeed* the present instead of being given alongside of it, it is because the future is not altogether determined at the present moment, and that if the time taken up by this succession is something other than a number, if it has for the consciousness that is installed in it absolute value and reality,

\* See page 10.

it is because there is unceasingly being created in it, not indeed in any such artificially isolated system as a glass of sugared water, but in the concrete whole of which every such system forms part, something unforeseeable and new. This duration may not be the fact of matter itself, but that of the life which reascends the course of matter; the two movements are none the less mutually dependent upon each other. *The duration of the universe must therefore be one with the latitude of creation which can find place in it.*

When a child plays at reconstructing a picture by putting together the separate pieces in a puzzle game, the more he practices, the more and more quickly he succeeds. The reconstruction was, moreover, instantaneous, the child found it ready-made, when he opened the box on leaving the shop. The operation, therefore, does not require a definite time, and indeed, theoretically, it does not require any time. That is because the result is given. It is because the picture is already created, and because to obtain it requires only a work of recomposing and rearranging—a work that can be supposed going faster and faster, and even infinitely fast, up to the point of being instantaneous. But, to the artist who creates a picture by drawing it from the depths of his soul, time is no longer an accessory; it is not an interval that may be lengthened or shortened without the content being altered. The duration of his work is part and parcel of his work. To contract or to dilate it would be to modify both the psychological evolution that fills it and the invention which is its goal. The time taken up by the invention, is one with the invention itself. It is the progress of a thought which is changing in the degree and measure that it is taking form. It is a vital process, something like the ripening of an idea.

The painter is before his canvas, the colors are on the palette, the model is sitting—all this we see, and also we

know the painter's style: do we foresee what will appear on the canvas? We possess the elements of the problem; we know in an abstract way, how it will be solved, for the portrait will surely resemble the model and will surely resemble also the artist; but the concrete solution brings with it that unforeseeable nothing which is everything in a work of art. And it is this nothing that takes time. Nought as matter, it creates itself as form. The sprouting and flowering of this form are stretched out on an unshrinkable duration, which is one with their essence. So of the works of nature. Their novelty arises from an internal impetus which is progress or succession, which confers on succession a peculiar virtue or which owes to succession the whole of its virtue—which, at any rate, makes succession, or *continuity of interpenetration* in time, irreducible to a mere instantaneous juxtaposition in space. This is why the idea of reading in a present state of the material universe the future of living forms, and of unfolding now their history yet to come, involves a veritable absurdity. But this absurdity is difficult to bring out, because our memory is accustomed to place alongside of each other, in an ideal space, the terms it perceives in turn, because it always represents *past* succession in the form of juxtaposition. It is able to do so, indeed, just because the past belongs to that which is already invented, to the dead, and no longer to creation and to life. Then, as the succession to come will end by being a succession past, we persuade ourselves that the duration to come admits of the same treatment as past duration, that it is, even now, unrollable, that the future is there, rolled up, already painted on the canvas. An illusion, no doubt, but an illusion that is natural, ineradicable, and that will last as long as the human mind!

*Time is invention or it is nothing at all.* But of time-

invention physics can take no account, restricted as it is to the cinematographical method. It is limited to counting simultaneities between the events that make up this time and the positions of the mobile T on its trajectory. It detaches these events from the whole, which at every moment puts on a new form and which communicates to them something of its novelty. It considers them in the abstract, such as they would be outside of the living whole, that is to say, in a time unrolled in space. It retains only the events or systems of events that can be thus isolated without being made to undergo too profound a deformation, because only these lend themselves to the application of its method. Our physics dates from the day when it was known how to isolate such systems. To sum up, *while modern physics is distinguished from ancient physics by the fact that it considers any moment of time whatever, it rests altogether on a substitution of time-length for time-invention.*

It seems then that, parallel to this physics, a second kind of knowledge ought to have grown up, which could have retained what physics allowed to escape. On the flux itself of duration science neither would nor could lay hold, bound as it was to the cinematographical method. This second kind of knowledge would have set the cinematographical method aside. It would have called upon the mind to renounce its most cherished habits. It is within becoming that it would have transported us by an effort of sympathy. We should no longer be asking where a moving body will be, what shape a system will take, through what state a change will pass at a given moment: the moments of time, which are only arrests of our attention, would no longer exist; it is the flow of time, it is the very flux of the real that we should be trying to follow. The first kind of knowledge has the advantage of enabling us to foresee the future and of making us in some measure masters

of events; in return, it retains of the moving reality only eventual immobilities, that is to say, views taken of it by our mind. It symbolizes the real and transposes it into the human rather than expresses it. The other knowledge, if it is possible, is practically useless, it will not extend our empire over nature, it will even go against certain natural aspirations of the intellect; but, if it succeeds, it is reality itself that it will hold in a firm and final embrace. Not only may we thus complete the intellect and its knowledge of matter by accustoming it to install itself within the moving, but by developing also another faculty, complementary to the intellect, we may open a perspective on the other half of the real. For, as soon as we are confronted with true duration, we see that it means creation, and that if that which is being unmade endures, it can only be because it is inseparably bound to what is making itself. Thus will appear the necessity of a continual growth of the universe, I should say of a *life* of the real. And thus will be seen in a new light the life which we find on the surface of our planet, a life directed the same way as that of the universe, and inverse of materiality. To intellect, in short, there will be added intuition.

The more we reflect on it, the more we shall find that this conception of metaphysics is that which modern science suggests.

For the ancients, indeed, time is theoretically negligible, because the duration of a thing only manifests the degradation of its essence: it is with this motionless essence that science has to deal. Change being only the effort of a form toward its own realization, the realization is all that it concerns us to know. No doubt the realization is never complete: it is this that ancient philosophy expresses by saying that we do not perceive form without matter. But if we consider the changing object at a certain essential



moment, at its apogee, we may say that there it just touches its intelligible form. This intelligible form, this ideal and, so to speak, limiting form, our science seizes upon. And possessing in this the gold-piece, it holds eminently the small money which we call becoming or change. This change is less than being. The knowledge that would take it for object, supposing such knowledge were possible, would be less than science.

But, for a science that places all the moments of time in the same rank, that admits no essential moment, no culminating point, no apogee, change is no longer a diminution of essence, duration is not a dilution of eternity. The flux of time is the reality itself, and the things which we study are the things which flow. It is true that of this flowing reality we are limited to taking instantaneous views. But, just because of this, scientific knowledge must appeal to another knowledge to complete it. While the ancient conception of scientific knowledge ended in making time a degradation, and change the diminution of a form given from all eternity—on the contrary, by following the new conception to the end, we should come to see in time a progressive growth of the absolute, and in the evolution of things a continual invention of forms ever new.

It is true that it would be to break with the metaphysics of the ancients. They saw only one way of knowing definitely. Their science consisted in a scattered and fragmentary metaphysics, their metaphysics in a concentrated and systematic science. Their science and metaphysics were, at most, two species of one and the same genus. In our hypothesis, on the contrary, science and metaphysics are two opposed although complementary ways of knowing, the first retaining only moments, that is to say, that which does not endure, the second bearing on duration itself. Now, it was natural to hesitate between so novel a con-

ception of metaphysics and the traditional conception. The temptation must have been strong to repeat with the new science what had been tried on the old, to suppose our scientific knowledge of nature completed at once, to unify it entirely, and to give to this unification, as the Greeks had already done, the name of metaphysics. So, beside the new way that philosophy might have prepared, the old remained open, that indeed which physics trod. And, as physics retained of time only what could as well be spread out all at once in space, the metaphysics that chose the same direction had necessarily to proceed as if time created and annihilated nothing, as if duration had no efficacy. Bound, like the physics of the moderns and the metaphysics of the ancients, to the cinematographical method, it ended with the conclusion, implicitly admitted at the start and immanent in the method itself: *All is given.*

That metaphysics hesitated at first between the two paths seems to us unquestionable. The indecision is visible in Cartesianism. On the one hand, Descartes affirms universal mechanism: from this point of view movement would be relative,<sup>1</sup> and, as time has just as much reality as movement, it would follow that past, present and future are given from all eternity. But, on the other hand (and that is why the philosopher has not gone to these extreme consequences), Descartes believes in the free will of man. He superposes on the determinism of physical phenomena the indeterminism of human actions, and, consequently, on time-length a time in which there is invention, creation, true succession. This duration he supports on a God who is unceasingly renewing the creative act, and who, being thus tangent to time and becoming, sustains them, communicates to them necessarily something of his absolute

<sup>1</sup> Descartes, *Principes*, ii. § 29.

reality. When he places himself at this second point of view, Descartes speaks of movement, even spatial, as of an absolute.<sup>1</sup>

He therefore entered both roads one after the other, having resolved to follow neither of them to the end. The first would have led him to the denial of free will in man and of real will in God. It was the suppression of all efficient duration, the likening of the universe to a thing *given*, which a superhuman intelligence would embrace at once in a moment or in eternity. In following the second, on the contrary, he would have been led to all the consequences which the intuition of true duration implies. Creation would have appeared not simply as *continued*, but also as *continuous*. The universe, regarded as a whole, would really evolve. The future would no longer be determinable by the present; at most we might say that, once realized, it can be found again in its antecedents, as the sounds of a new language can be expressed with the letters of an old alphabet if we agree to enlarge the value of the letters and to attribute to them, retro-actively, sounds which no combination of the old sounds could have produced beforehand. Finally, the mechanistic explanation might have remained universal in this, that it can indeed be extended to as many systems as we choose to cut out in the continuity of the universe; but mechanism would then have become a *method* rather than a *doctrine*. It would have expressed the fact that science must proceed after the cinematographical manner, that the function of science is to scan the rhythm of the flow of things and not to fit itself into that flow.—Such were the two opposite conceptions of metaphysics which were offered to philosophy.

It chose the first. The reason of this choice is undoubtedly the mind's tendency to follow the cinematographical

<sup>1</sup> Descartes, *Principes*, ii. §§ 36 ff.

method, a method so natural to our intellect, and so well adjusted also to the requirements of our science, that we must feel doubly sure of its speculative impotence to renounce it in metaphysics. But ancient philosophy also influenced the choice. Artists for ever admirable, the Greeks created a type of suprasensible truth, as of sensible beauty, whose attraction is hard to resist. As soon as we incline to make metaphysics a systematization of science, we glide in the direction of Plato and of Aristotle. And, once in the zone of attraction in which the Greek philosophers moved, we are drawn along in their orbit.

Such was the case with Leibniz, as also with Spinoza. We are not blind to the treasures of originality their doctrines contain. Spinoza and Leibniz have poured into them the whole content of their souls, rich with the inventions of their genius and the acquisitions of modern thought. And there are in each of them, especially in Spinoza, flashes of intuition that break through the system. But if we leave out of the two doctrines what breathes life into them, if we retain the skeleton only, we have before us the very picture of Platonism and Aristotelianism seen through Cartesian mechanism. They present to us a systematization of the new physics, constructed on the model of the ancient metaphysics.

What, indeed, could the unification of physics be? The inspiring idea of that science was to isolate, within the universe, systems of material points such that, the position of each of these points being known at a given moment, we could then calculate it for any moment whatever. As, moreover, the systems thus defined were the only ones on which the new science had hold, and as it could not be known beforehand whether a system satisfied or did not satisfy the desired condition, it was useful to proceed always and everywhere *as if* the condition was realized. There

was in this a methodological rule, a very natural rule—so natural, indeed, that it was not even necessary to formulate it. For simple common sense tells us that when we are possessed of an effective instrument of research, and are ignorant of the limits of its applicability, we should act as if its applicability were unlimited; there will always be time to abate it. But the temptation must have been great for the philosopher to hypostatize this hope, or rather this impetus, of the new science, and to convert a general rule of method into a fundamental law of things. So he transported himself at once to the limit; he supposed physics to have become complete and to embrace the whole of the sensible world. The universe became a system of points, the position of which was rigorously determined at each instant by relation to the preceding instant and theoretically calculable for any moment whatever. The result, in short, was universal mechanism. But it was not enough to formulate this mechanism; what was required was to find it, to give the reason for it and prove its necessity. And the essential affirmation of mechanism being that of a reciprocal mathematical dependence of all the points of the universe, as also of all the moments of the universe, the reason of mechanism had to be discovered in the unity of a principle into which could be contracted all that is juxtaposed in space and successive in time. Hence, the whole of the real was supposed to be given at once. The reciprocal determination of the juxtaposed appearances in space was explained by the indivisibility of true being, and the inflexible determinism of successive phenomena in time simply expressed that the whole of being is given in the eternal.

The new philosophy was going, then, to be a recommencement, or rather a transposition, of the old. The ancient philosophy had taken each of the *concepts* into which a

becoming is concentrated or which mark its apogee: it supposed them all known, and gathered them up into a single concept, form of forms, idea of ideas, like the God of Aristotle. The new philosophy was going to take each of the *laws* which condition a becoming in relation to others and which are as the permanent substratum of phenomena: it would suppose them all known, and would gather them up into a unity which also would express them eminently, but which, like the God of Aristotle and for the same reasons, must remain immutably shut up in itself.

True, this return to the ancient philosophy was not without great difficulties. When a Plato, an Aristotle, or a Plotinus melt all the concepts of their science into a single one, in so doing they embrace the whole of the real, for concepts are supposed to represent the things themselves, and to possess at least as much positive content. But a law, in general, expresses only a relation, and physical laws in particular express only *quantitative* relations between concrete things. So that if a modern philosopher works with the laws of the new science as the Greek philosopher did with the concepts of the ancient science, if he makes all the conclusions of a physics supposed omniscient converge on a single point, he neglects what is concrete in the phenomena—the qualities perceived, the perceptions themselves. His synthesis comprises, it seems, only a fraction of reality. In fact, the first result of the new science was to cut the real into two halves, quantity and quality, the former being credited to the account of *bodies* and the latter to the account of *souls*. The ancients had raised no such barriers either between quality and quantity or between soul and body. For them, the mathematical concepts were concepts like the others, related to the others and fitting quite naturally into the hierarchy of the Ideas. Neither was the body then defined by geometrical extension,

nor the soul by consciousness. If the *ψυχή* of Aristotle, the entelechy of a living body, is less spiritual than our "soul," it is because his *σῶμα*, already impregnated with the Idea, is less corporeal than our "body." The scission was not yet irremediable between the two terms. It has become so, and thence a metaphysic that aims at an abstract unity must resign itself either to comprehend in its synthesis only one half of the real, or to take advantage of the absolute heterogeneity of the two halves in order to consider one as a translation of the other. Different phrases will express different things if they belong to the same language, that is to say, if there is a certain relationship of sound between them. But if they belong to two different languages, they might, just because of their radical diversity of sound, express the same thing. So of quality and quantity, of soul and body. It is for having cut all connection between the two terms that philosophers have been led to establish between them a rigorous parallelism, of which the ancients had not dreamed, to regard them as translations and not as inversions of each other; in short, to posit a fundamental identity as a substratum to their duality. The synthesis to which they rose thus became capable of embracing everything. A divine mechanism made the phenomena of thought to correspond to those of extension, each to each, qualities to quantities, souls to bodies.

It is this parallelism that we find both in Leibniz and in Spinoza—in different forms, it is true, because of the unequal importance which they attach to extension. With Spinoza, the two terms Thought and Extension are placed, in principle at least, in the same rank. They are, therefore, two translations of one and the same original, or, as Spinoza says, two attributes of one and the same substance, which we must call God. And these two translations,

as also an infinity of others into languages which we know not, are called up and even forced into existence by the original, just as the essence of the circle is translated automatically, so to speak, both by a figure and by an equation. For Leibniz, on the contrary, extension is indeed still a translation, but it is thought that is the original, and thought might dispense with translation, the translation being made only for us. In positing God, we necessarily posit also all the possible views of God, that is to say, the monads. But we can always imagine that a view has been taken from a point of view, and it is natural for an imperfect mind like ours to class views, qualitatively different, according to the order and position of points of view, qualitatively identical, from which the views might have been taken. In reality the points of view do not exist, for there are only views, each given in an indivisible block and representing in its own way the whole of reality, which is God. But we need to express the plurality of the views, that are *unlike* each other, by the multiplicity of the points of view that are *exterior* to each other; and we also need to symbolize the more or less close relationship between the views by the relative situation of the points of view to one another, their nearness or their distance, that is to say, by a magnitude. That is what Leibniz means when he says that space is the order of coexistents, that the perception of extension is a confused perception (that is to say, a perception relative to an imperfect mind), and that nothing exists but monads, expressing thereby that the real Whole has no parts, but is repeated to infinity, each time integrally (though diversely) within itself, and that all these repetitions are complementary to each other. In just the same way, the visible relief of an object is equivalent to the whole set of stereoscopic views taken of it from all points, so that, instead of seeing in the relief a juxta-

position of solid parts, we might quite as well look upon it as made of the *reciprocal complementarity* of these whole views, each given in block, each indivisible, each different from all the others and yet representative of the same thing. The Whole, that is to say, God, is this very relief for Leibniz, and the monads are these complementary plane views; for that reason he defines God as "the substance that has no point of view," or, again, as "the universal harmony," that is to say, the reciprocal complementarity of monads. In short, Leibniz differs from Spinoza in this, that he looks upon the universal mechanism as an aspect which reality takes for us, whereas, Spinoza makes of it an aspect which reality takes for itself.

It is true that, after having concentrated in God the whole of the real, it became difficult for them to pass from God to things, from eternity to time. The difficulty was even much greater for these philosophers than an Aristotle or a Plotinus. The God of Aristotle, indeed, had been obtained by the compression and reciprocal compenetration of the Ideas that represent, in their finished state or in their culminating point, the changing things of the world. He was, therefore, transcendent to the world, and the duration of things was juxtaposed to His eternity, of which it was only a weakening. But in the principle to which we are led by the consideration of universal mechanism, and which must serve as its substratum, it is not concepts or *things*, but laws or *relations* that are condensed. Now, a relation does not exist separately. A law connects changing terms and is immanent in what it governs. The principle in which all these relations are ultimately summed up, and which is the basis of the unity of nature, cannot, therefore, be transcendent to sensible reality; it is immanent in it, and we must suppose that it is at once both in and out of time, gathered up in the

unity of its substance and yet condemned to wind it off in an endless chain. Rather than formulate so appalling a contradiction, the philosophers were necessarily led to sacrifice the weaker of the two terms, and to regard the temporal aspect of things as a mere illusion. Leibniz says so in explicit terms, for he makes of time, as of space, a confused perception. While the multiplicity of his monads expresses only the diversity of views taken of the whole, the history of an isolated monad seems to be hardly anything else than the manifold views that it can take of its own substance: so that time would consist in all the points of view that each monad can assume towards itself, as space consists in all the points of view that all monads can assume towards God. But the thought of Spinoza is much less clear, and this philosopher seems to have sought to establish, between eternity and that which has duration, the same difference as Aristotle made between essence and accidents: a most difficult undertaking, for the *ση* of Aristotle was no longer there to measure the distance and explain the passage from the essential to the accidental, Descartes having eliminated it for ever. However that may be, the deeper we go into the Spinozistic conception of the "inadequate," as related to the "adequate," the more we feel ourselves moving in the direction of Aristotelianism—just as the Leibnizian monads, in proportion as they mark themselves out the more clearly, tend to approximate to the Intelligibles of Plotinus.<sup>1</sup> The natural trend of these two philosophies brings them back to the conclusions of the ancient philosophy.

To sum up, the resemblances of this new metaphysic to that of the ancients arise from the fact that both suppose

<sup>1</sup> In a course of lectures on Plotinus, given at the Collège de France in 1897-1898, we tried to bring out these resemblances. They are numerous and impressive. The analogy is continued even in the formulæ employed on each side.

ready-made—the former above the sensible, the latter within the sensible—a science one and complete, with which any reality that the sensible may contain is believed to coincide. *For both, reality as well as truth are integrally given in eternity.* Both are opposed to the idea of a reality that creates itself gradually, that is, at bottom, to an absolute duration.

Now, it might easily be shown that the conclusions of this metaphysic, springing from science, have rebounded upon science itself, as it were, by ricochet. They penetrate the whole of our so-called empiricism. Physics and chemistry study only inert matter; biology, when it treats the living being physically and chemically, considers only the inert side of the living: hence the mechanistic explanations, in spite of their development, include only a small part of the real. To suppose *a priori* that the whole of the real is resolvable into elements of this kind, or at least that mechanism can give a complete translation of what happens in the world, is to pronounce for a certain metaphysic—the very metaphysic of which Spinoza and Leibniz have laid down the principles and drawn the consequences. Certainly, the psycho-physiologist who affirms the exact equivalence of the cerebral and the psychical state, who imagines the possibility, for some superhuman intellect, of reading in the brain what is going on in consciousness, believes himself very far from the metaphysicians of the seventeenth century, and very near to experience. Yet experience pure and simple tells us nothing of the kind. It shows us the interdependence of the mental and the physical, the necessity of a certain cerebral substratum for the psychical state—nothing more. From the fact that two things are mutually dependent, it does not follow that they are equivalent. Because a certain screw is

necessary to a certain machine, because the machine works when the screw is there and stops when the screw is taken away, we do not say that the screw is the equivalent of the machine. For correspondence to be equivalence, it would be necessary that to any part of the machine a definite part of the screw should correspond—as in a literal translation in which each chapter renders a chapter, each sentence a sentence, each word a word. Now, the relation of the brain to consciousness seems to be entirely different. Not only does the hypothesis of an equivalence between the psychical state and the cerebral state imply a downright absurdity, as we have tried to prove in a former essay,<sup>1</sup> but the facts, examined without prejudice, certainly seem to indicate that the relation of the psychical to the physical is just that of the machine to the screw. To speak of an equivalence between the two is simply to curtail, and make almost unintelligible, the Spinozistic or Leibnizian metaphysic. It is to accept this philosophy, such as it is, on the side of Extension, but to mutilate it on the side of Thought. With Spinoza, with Leibniz, we suppose the unifying synthesis of the phenomena of matter achieved, and everything in matter explained mechanically. But, for the conscious facts, we no longer push the synthesis to the end. We stop half-way. We suppose consciousness to be coextensive with a certain part of nature and not with all of it. We are thus led, sometimes to an “epiphenomenalism” that associates consciousness with certain particular vibrations and puts it here and there in the world in a sporadic state, and sometimes to a “monism” that scatters consciousness into as many tiny grains as there are atoms; but, in either case, it is to an incomplete Spinozism or to an incomplete Leib-

<sup>1</sup>“Le Paralogisme psycho-physiologique” (*Revue de métaphysique et de morale*, Nov. 1904, pp. 895-908). Cf. *Matière et mémoire*, Paris, 1896, chap. i.

nizianism that we come back. Between this conception of nature and Cartesianism we find, moreover, intermediate historical stages. The medical philosophers of the eighteenth century, with their cramped Cartesianism, have had a great part in the genesis of the "epiphenomenalism" and "monism" of the present day.

These doctrines are thus found to fall short of the Kantian criticism. Certainly, the philosophy of Kant is also imbued with the belief in a science single and complete, embracing the whole of the real. Indeed, looked at from one aspect, it is only a continuation of the metaphysics of the moderns and a transposition of the ancient metaphysics. Spinoza and Leibniz had, following Aristotle, hypostatized in God the unity of knowledge. The Kantian criticism, on one side at least, consists in asking whether the whole of this hypothesis is necessary to modern science as it was to ancient science, or if part of the hypothesis is not sufficient. For the ancients, science applied to *concepts*, that is to say, to kinds of *things*. In compressing all concepts into one, they therefore necessarily arrived at a *being*, which we may call Thought, but which was rather thought-object than thought-subject. When Aristotle defined God the *νοησεως νοησις*, it is probably on *νοησεως*, and not on *νοησις* that he put the emphasis. God was the synthesis of all concepts, the idea of ideas. But modern science turns on laws, that is, on relations. Now, a relation is a bond established by a mind between two or more terms. A relation is nothing outside of the intellect that relates. The universe, therefore, can only be a system of laws if phenomena have passed beforehand through the filter of an intellect. Of course, this intellect might be that of a being infinitely superior to man, who would found the materiality of things at the same time that

he bound them together: such was the hypothesis of Leibniz and of Spinoza. But it is not necessary to go so far, and, for the effect we have here to obtain, the human intellect is enough: such is precisely the Kantian solution. Between the dogmatism of a Spinoza or a Leibniz and the criticism of Kant there is just the same distance as between "it may be maintained that—" and "it suffices that—." Kant stops this dogmatism on the incline that was making it slip too far toward the Greek metaphysics; he reduces to the strict minimum the hypothesis which is necessary in order to suppose the physics of Galileo indefinitely extensible. True, when he speaks of the human intellect, he means neither yours nor mine: the unity of nature comes indeed from the human understanding that unifies, but the unifying function that operates here is impersonal. It imparts itself to our individual consciousnesses, but it transcends them. It is much less than a substantial God; it is, however, a little more than the isolated work of a man or even than the collective work of humanity. It does not exactly lie within man; rather, man lies within it, as in an atmosphere of intellectuality which his consciousness breathes. It is, if we will, a *formal* God, something that in Kant is not yet divine, but which tends to become so. It became so, indeed, with Fichte. With Kant, however, its principal rôle was to give to the whole of our science a relative and *human* character, although of a humanity already somewhat deified. From this point of view, the criticism of Kant consisted chiefly in limiting the dogmatism of his predecessors, accepting their conception of science and reducing to a minimum the metaphysic it implied.

But it is otherwise with the Kantian distinction between the matter of knowledge and its form. By regarding intelligence as pre-eminently a faculty of establishing re-

lations, Kant attributed an extra-intellectual origin to the terms between which the relations are established. He affirmed, against his immediate predecessors, that knowledge is not entirely resolvable into terms of intelligence. He brought back into philosophy—while modifying it and carrying it on to another plane—that essential element of the philosophy of Descartes which had been abandoned by the Cartesians.

Thereby he prepared the way for a new philosophy, which might have established itself in the extra-intellectual matter of knowledge by a higher effort of intuition. Coinciding with this matter, adopting the same rhythm and the same movement, might not consciousness, by two efforts of opposite direction, raising itself and lowering itself by turns, become able to grasp from within, and no longer perceive only from without, the two forms of reality, body and mind? Would not this twofold effort make us, as far as that is possible, re-live the absolute? Moreover, as, in the course of this operation, we should see intellect spring up of itself, cut itself out in the whole of mind, intellectual knowledge would then appear as it is, limited, but not relative.

Such was the direction that Kantianism might have pointed out to a revived Cartesianism. But in this direction Kant himself did not go.

He *would* not, because, while assigning to knowledge an extra-intellectual matter, he believed this matter to be either co-extensive with intellect or less extensive than intellect. Therefore he could not dream of cutting out intellect in it, nor, consequently, of tracing the genesis of the understanding and its categories. The molds of the understanding and the understanding itself had to be accepted as they are, already made. Between the matter presented to our intellect and this intellect itself there was

no relationship. The agreement between the two was due to the fact that intellect imposed its form on matter. So that not only was it necessary to posit the intellectual form of knowledge as a kind of absolute and give up the quest of its genesis, but the very matter of this knowledge seemed too ground down by the intellect for us to be able to hope to get it back in its original purity. It was not the "thing-in-itself," it was only the refraction of it through our atmosphere.

If now we inquire why Kant did not believe that the matter of our knowledge extends beyond its form, this is what we find. The criticism of our knowledge of nature that was instituted by Kant consisted in ascertaining what our mind must be and what Nature must be *if* the claims of our science are justified; but of these claims themselves Kant has not made the criticism. I mean that he took for granted the idea of a science that is one, capable of binding with the same force all the parts of what is given, and of co-ordinating them into a system presenting on all sides an equal solidity. He did not consider, in his *Critique of Pure Reason*, that science became less and less objective, more and more symbolical, to the extent that it went from the physical to the vital, from the vital to the psychical. Experience does not move, to his view, in two different and perhaps opposite ways, the one conformable to the direction of the intellect, the other contrary to it. There is, for him, only *one* experience, and the intellect covers its whole ground. This is what Kant expresses by saying that all our intuitions are sensuous, or, in other words, infra-intellectual. And this would have to be admitted, indeed, if our science presented in all its parts an equal objectivity. But suppose, on the contrary, that science is less and less objective, more and more symbolical, as it goes from the physical to the psychical, passing through



the vital: then, as it is indeed necessary to perceive a thing somehow in order to symbolize it, there would be an intuition of the psychical, and more generally of the vital, which the intellect would transpose and translate, no doubt, but which would none the less transcend the intellect. There would be, in other words, a supra-intellectual intuition. If this intuition exist, a taking possession of the spirit by itself is possible, and no longer only a knowledge that is external and phenomenal. What is more, if we have an intuition of this kind (I mean an ultra-intellectual intuition) then sensuous intuition is likely to be in continuity with it through certain intermediaries, as the infra-red is continuous with the ultra-violet. Sensuous intuition itself, therefore, is promoted. It will no longer attain only the phantom of an unattainable thing-in-itself. It is (provided we bring to it certain indispensable corrections) into the absolute itself that it will introduce us. So long as it was regarded as the only material of our science, it reflected back on all science something of the relativity which strikes a scientific knowledge of spirit; and thus the perception of bodies, which is the beginning of the science of bodies, seemed itself to be relative. Relative, therefore, seemed to be sensuous intuition. But this is not the case if distinctions are made between the different sciences, and if the scientific knowledge of the spiritual (and also, consequently, of the vital) be regarded as the more or less artificial extension of a certain manner of knowing which, applied to bodies, is not at all symbolical. Let us go further: if there are thus two intuitions of different order (the second being obtained by a reversal of the direction of the first), and if it is toward the second that the intellect naturally inclines, there is no essential difference between the intellect and this intuition itself. The barriers between the matter of sensible know-

ledge and its form are lowered, as also between the "pure forms" of sensibility and the categories of the understanding. The matter and form of intellectual knowledge (restricted to its own object) are seen to be engendering each other by a reciprocal adaptation, intellect modeling itself on corporeity, and corporeity on intellect.

But this duality of intuition Kant neither would nor could admit. It would have been necessary, in order to admit it, to regard duration as the very stuff of reality, and consequently to distinguish between the substantial duration of things and time spread out in space. It would have been necessary to regard space itself, and the geometry which is immanent in space, as an ideal limit in the direction of which material things develop, but which they do not actually attain. Nothing could be more contrary to the letter, and perhaps also to the spirit, of the *Critique of Pure Reason*. No doubt, knowledge is presented to us in it as an ever-open roll, experience as a push of facts that is for ever going on. But, according to Kant, these facts are spread out on one plane as fast as they arise; they are external to each other and external to the mind. Of a knowledge from within, that could grasp them in their springing forth instead of taking them already sprung, that would dig beneath space and spatialized time, there is never any question. Yet it is indeed beneath this plane that our consciousness places us; there flows true duration.

In this respect, also, Kant is very near his predecessors. Between the non-temporal, and the time that is spread out in distinct moments, he admits no mean. And as there is indeed no intuition that carries us into the non-temporal, all intuition is thus found to be sensuous, by definition. But between physical existence, which is spread out in space, and non-temporal existence, which can only be a conceptual and logical existence like that

of which metaphysical dogmatism speaks, is there not room for consciousness and for life? There is, unquestionably. We perceive it when we place ourselves in duration in order to go from that duration to moments, instead of starting from moments in order to bind them again and to construct duration.

Yet it was to a non-temporal intuition that the immediate successors of Kant turned, in order to escape from the Kantian relativism. Certainly, the ideas of becoming, of progress, of evolution, seem to occupy a large place in their philosophy. But does duration really play a part in it? Real duration is that in which each form flows out of previous forms, while adding to them something new, and is explained by them as much as it explains them; but to deduce this form directly from one complete Being which it is supposed to manifest, is to return to Spinozism. It is, like Leibniz and Spinoza, to deny to duration all efficient action. The post-Kantian philosophy, severe as it may have been on the mechanistic theories, accepts from mechanism the idea of a science that is one and the same for all kinds of reality. And it is nearer to mechanism than it imagines; for though, in the consideration of matter, of life and of thought, it replaces the successive degrees of complexity, that mechanism supposed by degrees of the realization of an Idea or by degrees of the objectification of a Will, it still speaks of degrees, and these degrees are those of a scale which Being traverses in a single direction. In short, it makes out the same articulations in nature that mechanism does. Of mechanism it retains the whole design; it merely gives it a different coloring. But it is the design itself, or at least one half of the design, that needs to be re-made.

If we are to do that, we must give up the method of *construction*, which was that of Kant's successors. We

must appeal to experience—an experience purified, or, in other words, released, where necessary, from the molds that our intellect has formed in the degree and proportion of the progress of our action on things. An experience of this kind is not a non-temporal experience. It only seeks, beyond the spatialized time in which we believe we see continual rearrangements between the parts, that concrete duration in which a radical recasting of the whole is always going on. It follows the real in all its sinuosities. It does not lead us, like the method of construction, to higher and higher generalities—piled-up stories of a magnificent building. But then it leaves no play between the explanations it suggests and the objects it has to explain. It is the detail of the real, and no longer only the whole in a lump, that it claims to illumine.

That the thought of the nineteenth century called for a philosophy of this kind, rescued from the arbitrary, capable of coming down to the detail of particular facts, is unquestionable. Unquestionably, also, it felt that this philosophy ought to establish itself in what we call concrete duration. The advent of the moral sciences, the progress of psychology, the growing importance of embryology among the biological sciences—all this was bound to suggest the idea of a reality which *endures* inwardly, which is duration itself. So, when a philosopher arose who announced a doctrine of evolution, in which the progress of matter toward perceptibility would be traced together with the advance of the mind toward rationality, in which the complication of correspondences between the external and the internal would be followed step by step, in which change would become the very substance of things—to him all eyes were turned. The powerful attraction that Spencerian evolutionism has exercised on contemporary

thought is due to that very cause. However far Spencer may seem to be from Kant, however ignorant, indeed, he may have been of Kantianism, he felt, nevertheless, at his first contact with the biological sciences, the direction in which philosophy could continue to advance without laying itself open to the Kantian criticism.

But he had no sooner started to follow the path than he turned off short. He had promised to retrace a genesis, and, lo! he was doing something entirely different. His doctrine bore indeed the name of evolutionism; it claimed to remount and redescend the course of the universal becoming; but, in fact, it dealt neither with becoming nor with evolution.

We need not enter here into a profound examination of this philosophy. Let us say merely that *the usual device of the Spencerian method consists in reconstructing evolution with fragments of the evolved*. If I paste a picture on a card and then cut up the card into bits, I can reproduce the picture by rightly grouping again the small pieces. And a child who working thus with the pieces of a puzzle-picture, and putting together unformed fragments of the picture finally obtains a pretty colored design, no doubt imagines that he has *produced* design and color. Yet the act of drawing and painting has nothing to do with that of putting together the fragments of a picture already drawn and already painted. So, by combining together the most simple results of evolution, you may imitate well or ill the most complex effects; but of neither the simple nor the complex will you have retraced the genesis, and the addition of evolved to evolved will bear no resemblance whatever to the movement of evolution.

Such, however, is Spencer's illusion. He takes reality in its present form; he breaks it to pieces, he scatters it in fragments which he throws to the winds; then he

"integrates" these fragments and "dissipates their movement." Having *imitated* the Whole by a work of mosaic, he imagines he has retraced the design of it, and made the genesis.

Is it matter that is in question? The diffused elements which he integrates into visible and tangible bodies have all the air of being the very particles of the simple bodies, which he first supposes disseminated throughout space. They are, at any rate, "material points," and consequently unvarying points, veritable little solids: as if solidity, being what is nearest and handiest to us, could be found at the very origin of materiality! The more physics progresses, the more it shows the impossibility of representing the properties of ether or of electricity—the probable base of all bodies—on the model of the properties of the matter which we perceive. But philosophy goes back further even than the ether, a mere schematic figure of the relations between phenomena apprehended by our senses. It knows indeed that what is visible and tangible in things represents our possible action on them. It is not by dividing the evolved that we shall reach the principle of that which evolves. It is not by recomposing the evolved with itself that we shall reproduce the evolution of which it is the term.

Is it the question of mind? By compounding the reflex with the reflex, Spencer thinks he generates instinct and rational volition one after the other. He fails to see that the specialized reflex, being a terminal point of evolution just as much as perfect will, cannot be supposed at the start. That the first of the two terms should have reached its final form before the other is probable enough; but both the one and the other are *deposits* of the evolution movement, and the evolution movement itself can no more be expressed as a function solely of the first than solely

of the second. We must begin by mixing the reflex and the voluntary. We must then go in quest of the fluid reality which has been precipitated in this twofold form, and which probably shares in both without being either. At the lowest degree of the animal scale, in living beings that are but an undifferentiated protoplasmic mass, the reaction to stimulus does not yet call into play one definite mechanism, as in the reflex; it has not yet choice among several definite mechanisms, as in the voluntary act; it is, then, neither voluntary nor reflex, though it heralds both. We experience in ourselves something of this true original activity when we perform semi-voluntary and semi-automatic movements to escape a pressing danger. And yet this is but a very imperfect imitation of the primitive character, for we are concerned here with a mixture of two activities already formed, already localized in a brain and in a spinal cord, whereas the original activity was a simple thing, which became diversified through the very construction of mechanisms like those of the spinal cord and brain. But to all this Spencer shuts his eyes, because it is of the essence of his method to recombine the consolidated with the consolidated, instead of going back to the gradual process of consolidation, which is evolution itself.

Is it, finally, the question of the correspondence between mind and matter? Spencer is right in defining the intellect by this correspondence. He is right in regarding it as the end of an evolution. But when he comes to retrace this evolution, again he integrates the evolved with the evolved—failing to see that he is thus taking useless trouble, and that in positing the slightest fragment of the actually evolved he posits the whole—so that it is vain for him, then, to pretend to make the genesis of it.

For, according to him, the phenomena that succeed

each other in nature project into the human mind images which represent them. To the relations between phenomena, therefore, correspond symmetrically relations between the ideas. And the most general laws of nature, in which the relations between phenomena are condensed, are thus found to have engendered the directing principles of thought, into which the relations between ideas have been integrated. Nature, therefore, is reflected in mind. The intimate structure of our thought corresponds, piece by piece, to the very skeleton of things—I admit it willingly; but, in order that the human mind may be able to represent relations between phenomena, there must first be phenomena, that is to say, distinct facts, cut out in the continuity of becoming. And once we posit this particular mode of cutting up such as we perceive it to-day, we posit also the intellect such as it is to-day, for it is by relation to it, and to it alone, that reality is cut up in this manner. Is it probable that mammals and insects notice the same aspects of nature, trace in it the same divisions, articulate the whole in the same way? And yet the insect, so far as intelligent, has already something of our intellect. Each being cuts up the material world according to the lines that its action must follow: it is these lines of *possible action* that, by intercrossing, mark out the net of experience of which each mesh is a fact. No doubt, a town is composed exclusively of houses, and the streets of the town are only the intervals between the houses: so, we may say that nature contains only facts, and that, the facts once posited, the relations are simply the lines running between the facts. But, in a town, it is the gradual portioning of the ground into lots that has determined at once the place of the houses, their general shape, and the direction of the streets: to this portioning we must go back if we wish to understand the particular mode of subdivision that causes each house

to be where it is, each street to run as it does. Now, the cardinal error of Spencer is to take experience already allotted as given, whereas the true problem is to know how the allotment was worked. I agree that the laws of thought are only the integration of relations between facts. But, when I posit the facts with the shape they have for me to-day, I suppose my faculties of perception and intellection such as they are in me to-day; for it is they that portion the real into lots, they that cut the facts out in the whole of reality. Therefore, instead of saying that the relations between facts have generated the laws of thought, I can as well claim that it is the form of thought that has determined the shape of the facts perceived, and consequently their relations among themselves: the two ways of expressing oneself are equivalent; they say at bottom the same thing. With the second, it is true, we give up speaking of evolution. But, with the first, we only speak of it, we do not think of it any the more. For a true evolutionism would propose to discover by what *modus vivendi*, gradually obtained, the intellect has adopted its plan of structure, and matter its mode of subdivision. This structure and this subdivision work into each other; they are mutually complementary; they must have progressed one with the other. And, whether we posit the present structure of mind or the present subdivision of matter, in either case we remain in the evolved: we are told nothing of what evolves, nothing of evolution.

And yet it is this evolution that we must discover. Already, in the field of physics itself, the scientists who are pushing the study of their science furthest incline to believe that we cannot reason about the parts as we reason about the whole; that the same principles are not applicable to the origin and to the end of a progress; that neither creation nor annihilation, for instance, is inadmissible

when we are concerned with the constituent corpuscles of the atom. Thereby they tend to place themselves in the concrete duration, in which alone there is true generation and not only a composition of parts. It is true that the creation and annihilation of which they speak concern the movement or the energy, and not the imponderable medium through which the energy and the movement are supposed to circulate. But what can remain of matter when you take away everything that determines it, that is to say, just energy and movement themselves? The philosopher must go further than the scientist. Making a clean sweep of everything that is only an imaginative symbol, he will see the material world melt back into a simple flux, a continuity of flowing, a becoming. And he will thus be prepared to discover real duration there where it is still more useful to find it, in the realm of life and of consciousness. For, so far as inert matter is concerned, we may neglect the flowing without committing a serious error: matter, we have said, is weighted with geometry; and matter, the reality which *descends*, endures only by its connection with that which *ascends*. But life and consciousness are this very ascension. When once we have grasped them in their essence by adopting their movement, we understand how the rest of reality is derived from them. Evolution appears and, within this evolution, the progressive determination of materiality and intellectuality by the gradual consolidation of the one and of the other. But, then, it is within the evolutionary movement that we place ourselves, in order to follow it to its present results, instead of recomposing these results artificially with fragments of themselves. Such seems to us to be the true function of philosophy. So understood, philosophy is not only the turning of the mind homeward, the coincidence of human consciousness with the living principle whence

it emanates, a contact with the creative effort: it is the study of becoming in general, it is true evolutionism and consequently the true continuation of science—provided that we understand by this word a set of truths either experienced or demonstrated, and not a certain new scholasticism that has grown up during the latter half of the nineteenth century around the physics of Galileo, as the old scholasticism grew up around Aristotle.

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