Preliminary Remarks

In the realm of culture science now holds sway over human civilization. But at the same time science has, in the realm of the mind, entered a period of deep and fecund trouble and self-examination. Scientists have to face the problem of over-specialization, and a general condition of permanent crisis which stems from an extraordinarily fast swarming of discoveries and theoretical renewals, and perhaps from the very approach peculiar to modern science. They have, in general, got rid of the idea that it is up to science to organize human life and society, and to supersede ethics and religion by providing men with the standards and values on which their destiny depends. Finally -- and this is the point with which I am especially concerned in this essay -- the cast of mind of scientists regarding religion and philosophy, as it appeared in the majority of them a century ago, has now profoundly changed.

There are, no doubt, atheists among scientists, as there are in any other category of people; but atheism is not regarded by them as required by science. The old notion of a basic opposition between science and religion is progressively passing away. No conflict between them is possible, Robert Williken declared. In many scientists there is an urge either toward more or less vague religiosity or toward definite religious faith; and there in an urge, too, toward philosophical unification of knowledge. But the latter urge still remains, more often than not, imbued with a kind of intellectual ambiguity.

No wonder, then, that the subject with which we are dealing -- what is the relation of modern science to man's knowledge of God -- demands a rather delicate, sometime complicated, analysis. In order to clear the ground, I shall begin with a few observations concerning the characteristic approach and way of knowledge peculiar to science as it has developed since post-Renaissance and post-Cartesian times, and become in our day, through an effort of reflection upon its own procedures, more and more explicitly aware of itself.

I don't disregard the differences in nature which separate physics from other sciences like biology or anthropology for instance. Yet physics is the queen of modern sciences, which, even when they cannot be perfectly mathematized, tend to resemble physics to one degree or another. So it is that for the sake of brevity I shall, while speaking of modern science, have modern physics especially in view.

Modern science has progressively "freed" or separated itself from philosophy (more specifically from the philosophy of nature) thanks to mathematics -- that is to say by becoming a particular type of knowledge whose data are facts drawn by our senses or instruments from the world of nature, but whose intelligibility is mathematical intelligibility. As a result, the primary characteristic of the approach to reality peculiar to science may therefore be described in the following way: that which can be observed and measured, and the ways through which observation and measurement are to be achieved, and the more or less unified mathematical reconstruction of such data, these things alone have a meaning for the scientist as such.

The field of knowledge particular to science is therefore limited to experience (as Kant understood the word). And when the basic notions that science uses derive from concepts traditionally used by common sense and philosophy, such as the notions of nature, matter, or causality, these basic notions are recast and restricted by science, so as to apply only to the field of experience and observable phenomena, understood and expressed in a certain set of mathematical signs. Thus it is that physicists may construct the concept of antimatter, for example, which has a meaning for them, but neither for the layman nor for the philosopher.
The expression "science of phenomena" is currently employed to designate our modern sciences. Such an expression is valid only if we realize, on the one hand, that the phenomena in question are (especially as far as physics is concerned) mathematized phenomena, and, on the other hand, that they are not an object separate from, but an aspect of that reality in se which is Nature. Let us say that science is a genuine, though oblique, knowledge of nature; it attains reality, but in its phenomenal aspect (in other words, in the aspect of reality which is definable through observation and measurement), and by the instrumentality of entities, especially mathematical entities, which may be "real" and relate to what Aristotelian realism called "quantity" as an accident of material substance, or may be purely ideal entities (entia rationis) and mere symbols grounded on data of observation and measurement.

Such ideal entities are the price paid for a tremendous privilege, namely the mathematical reconstruction of the data of experience. I observed a moment ago that modern science has freed itself from philosophy thanks to mathematics. At first mathematics were used by the sciences of nature in the framework of sense experience only. It has happened, however, that for more than a century mathematics themselves, starting with non-Euclidian geometries, have been breaking loose, more definitely and more completely than before, from the world of experience, and insisting on the possibility of developing -- in the realm of merely logical or ideal being (ens rationis) -- an infinite multiplicity of demonstrably consistent systems based on freely chosen and utterly opposed "axioms" or postulates. Consequently the science of phenomena (particularly physics) became able to pick out among various possible mathematical languages or conceptualizations, which make sense only to the mathematician, and deal with entities existing only within the mind, the one most appropriate to a given set of phenomena (while other sets of phenomena may be made mathematically intelligible through quite another conceptualization). So it is that from the point of view of common sense everything in the world capsizes in the highest and most comprehensive theories of contemporary physics as in Chagall's pictures. Modern science of phenomena has its feet on earth and uses its hands to gather not only correctly observed and measured facts, but also a great many notions and explanations which offer our minds real entities; yet it has its head in a mathematical heaven, populated with various crowds or signs and merely ideal, even not intuitively thinkable entities.

These ideal entities constructed by the mind are symbols which enable science to manipulate the world while knowing it as unknown, for then, in those higher regions where creative imagination is more at work than classical induction, science is only intent on translating the multifarious observable aspects of the world into coherent systems of signs.

The fact remains that the prime incentive of the scientist is the urge to know reality. Belief in the existence of the mysterious reality of the universe precedes scientific inquiry in the scientist's mind; and a longing (possibly more or less repressed) to attain this reality in its inner depths is naturally latent in him.

But as a scientist his knowledge is limited to a mathematical (or quasi-mathematical) understanding and reconstruction of the observable and measurable aspects of nature taken in their inexhaustible detail.

"Exclusive" scientists and "liberal" scientists

Now a distinction must be made between two categories of scientists, whom I would like to call, on the one hand, exclusive scientists, and, on the other hand, liberal scientists. This distinction has nothing to do with science itself, for in both categories men endowed with the highest scientific capacities can be found; but it is quite important from the point of view of culture.

"Exclusive" scientists are systematically convinced that science is the only kind of genuine rational knowledge of which man is capable. For them nothing can be known to human reason except through the means and intellectual equipment of science. Exclusive scientists may be of positivist persuasion,
and consequently reject any religious belief, save perhaps some kind of mythically constructed atheistic religion, like Auguste Comte's religion of humanity, which its high priest conceived of as a "positive regeneration of fetishism," or like Julian Huxley's "religion without revelation," which mistakes itself for a product of the "scientific method." Or they may shun positivist prohibitions, and superadd to scientific knowledge of a genuine, even deep religious faith, but which supposedly belongs to the world of feeling and pure irrationality. In no case is it possible, in their eyes, to establish the existence of God with rational certainty.

To tell the truth, the assertion that there is no valid rational knowledge except that of observable and measurable phenomena is self-destructive (it itself is quite another thing than a mere expression of inter-related phenomena). No wonder, consequently, that in contradistinction to exclusive scientists, "liberal" scientists are ready to look for a rational grasping of things which passes beyond phenomena, and even (when they are perfectly liberal scientists -- I think for instance of an eminent chemist like Sir Hugh Taylor, or an eminent physicist like Leon Brillouin) to admit the necessity of philosophy and of a properly philosophical equipment in order to make such grasping feasible, and so to complement the knowledge of nature provided by the sciences.

Nothing is more rational than the kind of extension of Niels Bohr's "principle of complementarity" implied by the cast of mind of these scientists. For, thus extended, this principle means simply that in two different fields of knowledge, or at two specifically distinct levels in our approach to reality, two different aspects in existing things (the phenomelogical and the ontological aspect) call for two different explanations (for instance "Man's cerebral activity is stimulated by such or such chemical" and "Man has a spiritual soul") -- which are moreover perfectly compatible, since they have to do with two essentially diverse objects to be grasped in things (so the medical approach to a person as a patient and the aesthetic approach to the same person as a poet are both distinct and compatible).

Einstein belonged to the category of liberal scientists. For many years his notion of God was akin to that of Spinoza. Yet, as recent studies on him have shown, he came, with the progress of age and reflection, to consider the existence of that personal God whom he first doubted as required by the way in which nature lends itself to the rationalization of phenomena operated by science. As he said in an interview in 1950, far from being an atheist he "believed on the contrary in a personal God." Such a conviction meant in no way that the existence of God was supposedly a conclusion established by science, or a principle of explanation used by it. It meant that the existence of God is a conclusion philosophically established with regard to the very possibility of science.

Heisenberg and Oppenheimer are also liberal scientists. And so was, at least virtually, Max Planck, though it was under the cloak of science that every bit of philosophizing effort in him was concealed. He believed in an "all-powerful intelligence which governs the universe," but not in a personal God, and he thought that we could and should "identify with each other . . . the order of the universe which is implied by the sciences of nature and the God whom religion holds to exist." Such statements definitely transcend the field of experience and measurable data, though they remain inherently ambiguous: for how could an all-powerful reason govern the universe if it were not personal? And the God whom religion holds to exist is a transcendent God, who causes the order of the universe, but his philosophical "identification" with this order would make him co-substantial with the world, as the God of the Stoics was.

Such intellectual ambiguity is not infrequent, I have already mentioned the fact. Let us consider it now a little more closely. I would say that the ambiguity in question is essential in exclusive scientists so far as they take a stop outside science itself. They emphatically deny the validity of any kind of rational knowledge of reality which is not science itself. As a result, if they are not of positivist persuasion, and do not think that all we can know is phenomena alone, in other words, if, recognizing that phenomena are but an aspect of a deeper reality, they endeavor to go beyond phenomena, they do
so through an extrapolation of scientific notions which, brilliant as it may be, is essentially arbitrary; or looking for a "noetic ~integrator" they borrow it from some kind of metaphysics unaware of itself and disguised as science -- and there is no worse metaphysics than disguised metaphysics.

As regards liberal scientists the picture is basically different. I would say that the ambiguity we are discussing can still most often be found in them, but as something accidental, not essential to their cast of mind; so that, as a matter of fact, there are good grounds to hope that more and more of them will, in the process of time, free themselves from it -- when philosophers will become more intent on meditating on the sciences and learning their languages, and scientists more familiar with the approach and language of philosophy (each one realizing at the same time that the language or languages of the others are valid instruments only for the others' work).

If a liberal scientist undertakes to go beyond the horizons of science and tackle the philosophical aspects of reality, he too is liable to yield to the temptation of making the concepts worked out by science into the very components of his meta-scientific enterprise. The trouble is that one can no more philosophize with non-philosophical instruments than paint with a flute or a piano.

But such a state of affairs is only a side-effect of the fact that scientists, however liberal, are prone, as everybody is, to overvalue the intellectual equipment they have tested in their particular field, and in the handling of which they have full competence. Liberal scientists do not, for all that, systematically deny the validity of another, perhaps more appropriate intellectual equipment; they are aware, moreover of the philosophical nature of their own effort of reflection upon science and its procedures; and by the very fact they are, at least implicitly, prepared to recognize the rights of that purely or genuinely philosophical approach in which they, still often hesitate to put their own trust. That is why the ambiguity of the way in which many of them go in for philosophy is accidental ambiguity.

Furthermore, being accidental, such ambiguity can be removed; the best proof of this is the fact that in actual existence it has been most explicitly removed in some scientists who, when it comes to philosophical matters, do not mind using themselves the strict philosophical approach. At this point I am thinking in particular of the Epilogue which the distinguished physiologist Andrew Ivy wrote for the book "the Evidence of God," in which he insists that God's existence can be rationally demonstrated with absolute certainty. Though a professional philosopher would probably have added a few considerations on knowledge through analogy and the non-restricted value of the notion of cause, these pages written by a scientist are, as they stand, a remarkable piece of philosophy which enters with perfect intellectual frankness and with the appropriate intellectual equipment a sphere inaccessible to the instruments of science, and which gives to a truth intuitively known to the intellect like the principle of causality its full ontological bearing, so as to recognize the necessity of a Prime Cause that absolutely transcends the whole field of experience.

The crucial question

The crucial question for our age of culture is, thus, whether reality can be approached and known, not only "phenomenally" by science, but also "ontologically" by philosophy.

This question is still more crucial for the common man than for the scientist. For the impact of the habits of thinking prevalent in an industrial civilization, in which manipulation of the world through science and technique plays the chief part, results in a loss of the sense of being in the minds of a large number of people, who are not scientists but grant rational value to facts and figures only. Whereas exclusive scientists know at least what science is and what its limitations are, the people of whom I am speaking have no experience of science, and they believe all the more naively that science is the only valid rational approach to reality, nay more, that science has all the rational answers which human life can need.
Consequently, any rational knowledge of God's existence -- either prephilosophical (by the simple natural use of reason) or philosophical (by the use of reason trained in philosophical disciplines) -- is a dead letter as far as they are concerned.

Persons whose intellect has shrunk in this way may adhere to some religious creed and have a religious belief in God -- either as a gift of divine grace, or as a response to irrational needs or as a result of their adjustment to a given environment. But they are atheists as far as reason is concerned.

Such a situation is utterly abnormal. Religious faith is above reason, but normally presupposed the rational conviction of God's existence.

At this point we must lay stress on the nature of philosophy and distinguished from sciences, and insist that philosophy is an autonomous discipline, which has its own instruments; so that it is not enough to add to scientific knowledge even a most intelligent philosophical reflection; the proper philosophical training and proper philosophical equipment are necessary.

Let us say that whereas science, or phenomenal knowledge, offers us, with wonderful richness paid for by revolutionary changes, coded maps of what matter and nature are as to the multifarious observable and measurable interactions which occur in them, -- philosophy makes us grasp, with greater stability paid for by limitation to essentials, what things are in the intrinsic reality of their being. Though carrying common sense and the natural language to an essentially higher level, philosophy is in continuity with them, and is based on the perceptive (not only constructive) power of the intellect as well as on sense experience. In other words, being is the primary object of philosophy, as it is in human reason; and all notions worked out by philosophy are intelligible in terms of being not of observation and measurement.

As a result, we have to realize that in the very universe of experience philosophy (the philosophy of nature) deals with aspects and explanations in which science is not interested. Thus matter (that is, material substances) is composed in the eyes of old but still valid Aristotelian hylomorphism, of two elemental pure and indetermined potentiality (materia prima), and determinative form or entelechy (which, in man, is spiritual soul); whereas for science matter (or mass, that is, a given set of measurable data expressed in mathematical equations) is composed of certain particles, most of them impermanent, scrutinized by nuclear physics. And it is up to philosophy to try to bring into some sort of unity our knowledge of nature, not by making science's explanations parts of its own explanations, but by interpreting them in its own light, whether it sorts out what pertains to real though phenomenal entities from what pertains to ideal entities in scientific explanatory theories, or points out the philosophical truths (sometimes to be improved and readjusted) which have some connection with these theories, and especially with all the treasure of facts and factual assertions which is mustered and continually increased by science.

Now being is not limited to the field of sense experience; it goes beyond. And the basic concepts of reason which deal with being as such, even though they apply first to the realm of experience, can apply too -- in an "analogical" manner -- to realities which transcend experience. As a result philosophy (this time I don't mean the philosophy of nature, I mean metaphysics) can attain to realities which escape sense experience and sense verification, in other words which belong to the spiritual or "supra-sensible" order.

Let us remember at this point that philosophy is but a superior stage in the natural use of reason, at the level of a knowledge which is not only knowledge but wisdom, and which (in contradistinction to common sense) is critically elaborated and completely articulated. Prior to philosophy, the natural use of reason is natural in an additional sense (in the sense of untrained and merely spontaneous); with philosophy it is perfected by reflectivity, fully mature, and capable of explicit demonstration, aware of its own validity.
It is by virtue of the very nature of human reason -- either untrained or philosophically perfected -
that the concept of cause and the principle of causality can lead us beyond the field of experience. As Dr.
Ivy has rightly pointed out, if the child uses the principle of causality in asking why things exist, he
does so not by reason of the transitory peculiarities of "childish mentality," but on the contrary,
because he is awakening to genuine intellectual life.

There is, thus, a pre-philosophical, simply natural knowledge of God's existence. It can be
described as starting from the primordial intuition of existence, and immediately perceiving that
Being-with-nothingness, or things which could possibly not be -- my own being, which is liable to death
-- necessarily presuppose Being-without-nothingness, that is, absolute or self-subsisting Being, which
causes and activates all beings. This pre-philosophical knowledge can also be described as a
spontaneous application of the principle: no artifact is possible without a maker.

And there is, in the realm of metaphysical wisdom, a philosophical knowledge of God's existence,
which is able fully to justify itself and uses ways of arguing that proceed with full rational rigor.

The philosophical proofs of God's existence

The "five ways" of Thomas Aquinas are the classical example of the philosophical approach to
God of which I just spoke. It seems relevant to give at this point some idea of them, at least of the
first and the last two.

The first way proceeds from Motion or Change. There is no fact more obvious here below than
the fact of change, through which a thing becomes what it was not. But one thing can give to itself
what it does not have, at least in potency, and potency cannot pass to actuation by itself alone.
Everywhere where there is motion or change (even if it is self-motion as in living beings), there is
something else which is causing, the change. Now if the cause in question is itself subject to change,
then it in moved or activated by another agent. But it is impossible to regress from agent to agent
without end; if there were not a First Agent, the reason for the action of all others would never be
posited in existence. So it is necessary to stop at a Prime Cause, itself uncaused, absolutely exempt
from any change for it is absolutely perfect.

In the same manner the second way, which proceeds from Efficient Causes at work in the world,
and the third way, which proceeds from Contingency and Necessity in things, lead to a Prime Cause
without which all other causes would neither be nor act, and which exists with absolute necessity, in
the infinite transcendence of the very esse subsisting by itself.

The fourth way proceeds from the Degrees which are in things. It is a fact that there are degrees
of value or perfection in things. But on the one hand wherever there are degrees it is necessary that
there exist, somewhere, a supreme degree; and on the other hand one thing is good and another is
better, but there can always be another still better, so that there is no supreme degree in the possible
degrees of goodness or beauty, or finally being, of which things are capable. Goodness, beauty, being
are not in their fulness in any one of the things we touch and see. The supreme degree of goodness of
beauty, of being, exists elsewhere in a Prime Being which causes all that there is of goodness, beauty and
being in things, a First Cause which does not have goodness, beauty and being, but is self-subsisting
Being, Goodness and Beauty.

The fifth way proceeds from the intrinsic Order and purposeful Governance of the world. The
very fact that in the material universe things are engaged in a system of stable relations and that a
certain order among them exists and endures shows that they do not result from chance. A purpose in
at work in that republic of natures which is the world. But such purpose cannot proceed from the
things which compose the world of matter, and which are devoid of understanding. This purpose or
intention must exist in an intellect on which things depend in their very essence and natural activities.
Thus in the last analysis it is necessary to recognize the existence of a transcendent Intelligence, the
existing of which is its very intellection, and which is the Cause of all beings.
I just summarized these ways to God in my own language and in the briefest possible fashion, leaving aside all particular examples, accidental to the demonstration, which were part of the imagery provided to Thomas Aquinas by the physics of his time.

The ways in question pertain to the philosophical order. The notion of cause has here its full ontological import, which connotes productivity in being, in contradistinction to the mere relationships between phenomena which science considers and in which a given phenomenon is a dependent variable of another. Furthermore, we are led by rational argumentation to a Prime Cause which in absolutely and infinitely transcendent, and which the very concept of cause, like that of being, of goodness, of intelligence, etc., attain only "by analogy" or in the mirror of things: what they mean in God has a proportion with respect to God similar to the proportion which what they mean in things has with respect to things; but we don't grasp it in itself. God exists as no other being exists, He is good as no other being is good, He knows and loves as no other being does...

It must be noted that considered in their very substance the "five ways' of Thomas Aquinas stand fast against any criticism. Modern philosophy has been in this connection the victim of a tragic misunderstanding. Descartes believed that from the sole idea of an infinitely, perfect being the existence of this being necessarily followed (the so-called "ontological argument"). Kant rightly stated that such "proof" was no proof at all. But he also stated -- quite mistakenly -- that all other proofs of God's existence implied the validity of the ontological argument and rested on it; as a result, no valid proof was possible. And Kant's successors followed on Kant's heels. Yet it is crystal clear that Thomas Aquinas' five ways do not start from the idea of an infinitely perfect being: they proceed in the opposite manner; they start from certain facts, quite general and quite undeniable; and from these facts they infer the necessary existence of a First Cause -- which is infinitely perfect. Infinite perfection is at the end, not at the beginning of the demonstration.

Finally let us add that there are other ways, too, than the classical five ways. I myself have proposed a "sixth way." As a matter of fact there are for men as many ways of knowing that God exists as there are steps he may take on the earth or paths to his own heart. For all our perishable treasures of being and beauty are besieged on all sides by the immensity and eternity of the One Who Is.

**Sciences as witnessing to God's existence**

Among all these approaches to God, one particularly significant for the man of our present civilization is provided by science itself. The sciences of phenomena -- though they remain enclosed in the field of experience -- bear testimony to the existence of God in a double manner. Here, as I previously noted, it is not a question of what science itself tells us, but of the very existence and possibility of science.

In the first place: if nature were not intelligible there would be no science. Nature is not perfectly and absolutely intelligible; and the sciences do not try to come to grips with nature's intelligibility taken in itself (that's the job of philosophy). They rather reach for it in an oblique fashion, dealing with it only insofar as it is steeped in, and masked by, the observable and measurable data of the world of experience, and can be translated into mathematical intelligibility. Yet the intelligibility of nature is the very ground of those relational constancies which are the "laws" -- including that category of laws which deal only with probabilities -- to which science seen phenomena submitted; and it is the very ground, in particular, of the highest explanatory systems, with all the symbols, ideal entities, and code languages they employ (and with all that in them which is still incomplete, arbitrary, and puzzlingly lacking in harmony) that science constructs on observation and measurement.

Now how would things be intelligible if they did not proceed from an intelligence? In the last analysis a Prime Intelligence must exist, which is itself Intellecction and Intelligibility in pure act, and which is the first principle of the intelligibility and essences of things, and causes order to exist in
them, as well as an infinitely complex network of regular relationships, whose fundamental mysterious
unity our reason dreams of rediscovering in its own way.

Such an approach to God's to existence is a variant of Thomas Aquinas' fifth way. Its impact was
secretly present in Einstein's famous saying: "God does not play dice," which, no doubt, used the
word God in a merely figurative sense, and meant only: "nature does not result from a throw of the
dice," yet by the very fact implicitly postulated the existence of the divine Intellect.

But science offers us a second philosophical approach, which, this time, relates to man's intellect.
The sciences of phenomena, and the manner in which they contrive ways of knowing and mastering
nature -- ceaselessly inveigling it into more and more precise observations and measurements, and
finally catching it in sets of more and more perfectly systematized signs -- give evidence, in a
particularly striking manner, of the power that human intelligence puts to work in the very universe of
sense experience. Now the intelligence of man -- imperfect as it is, and obliged to use an irreducible
multiplicity of types and perspectives of knowledge -- is a spiritual activity which can neither proceed
from matter nor be self-subsisting, and therefore limitless and all-knowing. It has a higher source, a
certain participation in which it is. In other words, it necessarily requires the existence of a Prime,
transcendent and absolutely perfect Intellige, which is pure Intellection in act and whose being is its
very Intellection.

This second approach is a variant of Thomas Aquinas' fourth way.

To conclude, let us remark that our knowledge of the created world naturally reverberates in the
very reverence and awe with which our reason knows the Creator, and on the very notion, deficient as
it is and will ever be, that we have of His ways.

By the very fact that science enlarges our horizons with respect to this world, and makes us know
better -- though in an oblique way -- that created reality which is the mirror in which God's
perfections are analogically known, science helps our minds to pay tribute to God's grandeur.

A number of the most basic notions and explanatory theories of modern science, especially of
modern physics, recoil from being translated into natural languages or from being represented in
terms of the imagination. Nevertheless a certain picture of the world emerge from modern science;
and this picture (unification of matter and energy, physical indeterminism, a space-time continuum
which implies that space and time are not empty pre-existing forms but come to existence with things
and through things; gravitational fields which by reason of the curvation of space exempt gravitation
from requiring any particular force, and outwit ether and attraction; a cosmos of electrons and stars in
which the stars are the heavenly laboratories of elements, a universe which is finite but whose limits
cannot be attained, and which dynamically evolves toward higher forms of individuation and
concentration... ) constitutes a kind of framework or imagery more suited to many positions of a
sound philosophy of nature than that which was provided by Newtonian science.

Furthermore, at the core of this imagery there are a few fundamental concepts which, inherent in
modern science and essential to it, have a direct impact on our philosophical view of nature.

In the first place I shall mention all the complex regularities (presupposed by statistical laws
themselves), and the mixture of organization and chance, resulting in a kind of elusive, imperfectly
knowable and still more striking order, that matter reveals in the world of microphysics. It make our
idea of the order of nature exceedingly more refined and more astonishing. And it makes us look at
the author of this order with still more admiration and natural reverence. In the Book of Job
Behemoth and Leviathan were called to witness to divine omnipotence. One single atom may be
called to witness too, as well as the hippopotamus and crocodile. If the heavens declare the glory
of God, so does the world of micro-particles and micro-waves.

In the second place comes the notion of evolution evolution of the whole universe of matter, and,
in particular, evolution of living organisms. Like certain most general tenets of science, evolution is
less a demonstrated conclusion than a kind of primary concept which has such power in making
phenomena decipherable that once expressed it became almost impossible for the scientific mind to do without it. Now if it is true that in opposition to the imobile archetypes and ever-recurrent cycles of Pagan antiquity Christianity taught men to conceive history both an irreversible and as running in a definite direction, then it may be said that by integrating in science the dimension of time and history, the idea of evolution has given to our knowledge of nature a certain affinity with what the Christian view of things is on a quite different plane. In any case, the genesis of elements and the various phases of the history of the heavens, and, in the realm of life, the historical development of an immense diversity of evolutive branches ("phyla"), all this, if it is understood in the proper philosophical perspective, presupposes the transcendent God as the prime cause of evolution, -- preserving in existence created things and the impetus present in them, moving them from above so that superior forms may emerge from inferior ones, and, when man is to appear at the peak of the series of vertebrates, intervening in a special way and creating *ex nihilo* the spiritual and immortal soul of the first man and of every individual of the new species. Thus evolution correctly understood offers us a spectacle whose greatness and universality make the activating omnipresence of God only more tellingly sensed by our minds.

I do not believe, moreover, that science fosters a particularly optimistic view of nature. Every progress in evolution is dearly paid for; miscarried attempts, merciless struggle everywhere. The more detailed our knowledge of nature becomes, the more we see, together with the element of generosity and progression which radiates from being, the law of degradation, the powers of destruction and death, the implacable voracity which are also inherent in the world of matter. And when it comes to man, surrounded and invaded as he is by a host of warping forces, psychology and anthropology are but an account of the fact that, while being essentially superior to all of them, he is the most unfortunate of animals. So it is that when its vision of the world is enlightened by science, the intellect which religious faith perfects realizes still better that nature, however good in its own order, does not suffice, and that if the deepest hopes of mankind are not destined to turn to mockery, it is because a God-given energy better than nature is at work in us.

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