

by scientists, philosophers, and theologians by assuming a univocal meaning of these expressions. Not that this would have been able to defeat the first evolutionist scientists, for it must be admitted, they gave to experimental science an exhaustive coverage of reality: science was their philosophy. The confusion of philosophers and theologians is more regrettable for they have not always been able to discern what is true in the pseudo-scientific generalizations of a Lamarck or Darwin.

St. Thomas, in the very place where he treats this question, cautions us against a blind zeal that invites the derision of non-believers: "ne quidquid verum aliquis esse crediderit, statim velit asserere, hoc ad veritatem fidei pertinere . . . quia ab infidelibus veritas fidei irridetur, cum ab aliquo simplici et fidei tamquam ad fidem pertinens proponitur quid certissimis documentis falsum esse ostenditur."²⁸

The very progress of science involves a precision and purification of its vocabulary in a way that inspires hope. Soon all will see what is and what is not at issue.

Conclusion

Science, while being only a flat projection of what has relief and depth, enables us to foresee the immense effort and the prodigious cost nature invests in the preparation for the coming of man. And whether he knows it or not, everything that happens in the world is done for him. The scale of natural species is only a scale of assault. If man is the *ultimum in executione*, he is nonetheless the *primum in intentione*. The all too poor account that we have given enables us to suspect the richness of the human being who contains virtually all the degrees of perfection of that which is below him. And it is not only in the formidable display of power that we should look for this richness: the reaches of space, the unimaginable masses, the vertiginous speeds of astronomy are not worth a lily. But we have also seen that we have need of the stars to understand the lily. We will only be able to understand ourselves when we understand the universe. Our present is filled with the past.

The more profoundly we understand the world, the better we comprehend that we touch it only with the feet, and that with our head we touch the bottom rungs of another hierarchy of which nature is only a fleeting shadow.

TWO

The Philosophical Point of View

1. Preliminary Notions

a. *Becoming*

By the term 'nature,' taken in a general sense, we mean the coordinated ensemble of spatio-temporal things which surround us and of which we are a part. Becoming is the common and specific character of each thing in this ensemble. The universality of becoming is most obvious in temporal duration. The natural being which seems not to change or be changed in any other way can only continue its existence on condition that it be constantly renewed. Existence is received by it only in a successive and continuous manner. Successive and continuous duration is the definition of *time*. If this successive duration were not continuous the natural being could only exist by always becoming other. In this regard the whole of nature is in a state of constant flow.

Natural being changes in many other respects. But the other changes, whatever they be, always involve time. Moreover, these other ways of changing are not particular or special cases of temporal duration. It cannot therefore be time which expresses this general mobility of the natural being, a mobility of which time is only a particular case, for even though it is implicated in the other cases, it is distinct from them. Let us say then that a natural being is a *mobile being*. And that nature is an ensemble of *fluxibilia*.

Manifestly we are dupes of a verbal trick when we say that a mobile being is a natural being. 'Natural' is after all a vague term. And to take 'nature' in a strict sense, as we will see in what follows, we must define it in terms of mobility.

It is *mobile being*, not as being, but under the precise angle of mobility, *ens mobile in quantum mobile*, mobile being precisely as mobile, that is the formal object of the Philosophy of Nature.

Note that we have not yet mentioned 'matter' and 'body.'

b. Generation and Corruption

Mobile being only becomes by receiving existence successively. The plant grows, the animal learns, the man becomes ill. Beings are enriched and impoverished. Perfections are incessantly engendered and corrupted.

The cow is nourished by grass. She is enriched. But the grass in becoming cow is decomposed. The capital of nature is limited. When one being is enriched, another is impoverished. So, too, a corruption accompanies every generation.

There are not only accidental generations and corruptions in nature, like the accidental generation in the cow that feeds: this generation entailed the corruption of the grass. And the cow engenders a calf: substantial generation.

c. Natural Species

The ensemble of beings constituting nature is divided into four species: men, animals, plants, and the inorganic. One can know without understanding: animal; live without knowing: plant; be without living: inorganic. These four species are the only ones philosophically definable. The canine species is not a species in the philosophical sense.

Natural species thus constitute a hierarchy. The plant is manifestly more perfect than the rock or a nebula (abstracting from the life it may contain), being at once corporeal and vegetative. The animal is at once sensitive, vegetative, and corporeal; to which man adds rationality. We say that these species are essentially different. One lives or one does not, one can know or one cannot. There is no intermediary.

However, despite the essential difference between the four species, they always have something in common. Man and the dog are truly animals, and like the plant they are truly vegetative, and like the inorganic they are truly corporeal. They have a *common genus*. With respect to man, the genus animal is called the *proximate genus* (*genus proximum*), whereas the vegetative genus is only a *remote genus* (*genus remotum*). The definition of a being should include both the proximate genus and the *specific difference*. We define man as *rational animal*. The inorganic species has only a negative definition: non-living being.

The fact that the animal is sensitive, vegetative, and corporeal does not mean that it is composed of four superimposed beings constituting an ensemble we call animal. It must be *one*: its essence must be one. The essence

makes a being what it is. It is the same essence that is at once animal, vegetative, and corporeal. Thus we say that between the different degrees constitutive of an essence there exists only a *virtual* distinction.

d. Individual and Species

Not all natural beings differ essentially. Two men are essentially equal, as are two animals and two plants. They are however profoundly different. We say that they are *individually* distinct, being opposed only in a *homogeneous* fashion, whereas the plant and the animal are opposed in a heterogeneous way.

We call space the homogeneous exteriority constituted by homogenous opposition. Homogeneous opposition exists only between two individuals in the sense defined above. Any homogeneous opposition whatever constitutes spatial exteriority. There exists between the animal and man insofar as he is animal a homogeneous opposition: all beings which have a *common natural genus* are opposed in this manner. And the opposition between any two accidental entities, from the moment that it is real and homogeneous, is spatial. Beings are not only *in* space: space arises from their opposition. In a universe where there is only pure heterogeneity there is no space. These beings would be specifically opposed outside of any *natural* common genus.

2. A Precise Example of a Problem in Philosophy of Nature

The few notions that we have just summarily defined already raise a host of problems, of which the most general is that of becoming, that of mobile being. I say that the problems are raised for mobile being is given in advance. It is *mobile being as given* which raises a problem in our minds. Apparently, a mobile being is a contradictory being. In order to be, it must be successively other. But if it is always other, how can it be what it is? And if it is not always the same across the succession, how can it succeed itself continuously? Mobile being must be a being which changes and which does not change.

Are we going to say that mobile being is composed of two parts, one of which changes and the other of which is immobile? This solution is too easy. And yet it is necessary to arrive at a distinction. What will be the terms of the distinction?

Metaphysics demonstrates that in every finite being, essence and existence are really distinct. Essence and existence are not beings, but simply the principles of being. But mobile being is a finite being. Is this the distinction that will afford us a solution?

Would I say that existence changes constantly while the essence remains immobile, and that it is by its immobility that the identity of the being is safeguarded? That won't work: for such an essence would both *simultaneously* and *successively* have existence. Mobility penetrates to the very essence of a being which exists successively.

But how can mobility penetrate into my essence, if my essence is that which makes me what I am? If, by enduring, I change essentially, I am always essentially other, and my identity vanishes. I could not say that yesterday I gave a lecture, for I would no longer be 'I.'

The problem becomes more and more difficult. It is necessary that my essence be capable of receiving existence successively without losing its identity. We are indeed forced to see in the essence a *multiple*. A multiple not of things, for the same problem would be posed with respect to them (and moreover that would come down to saying that a mobile being is possible only on condition of being some non-mobile beings), but a multiple of elements of another order: an order to which we are led by logic. The multiple in question should enable us to comprehend by what condition a being which endures successively and continuously is possible. The elements in question will therefore be by definition the *conditions of being of the mobile*, and not of beings: principles of the essence of the mobile, one of which permits that essence to receive existence successively, the other to safeguard the identity of the essence.

But on what condition can a multiplicity of principles make an essence *one*? They must be such that the unity of the essence is saved. If the two principles were each an essence, that is, a determination, they could only make an essence double; and there would be only an accidental link between them, as between the essence and existence of the finite being as such.

Thus we are *constrained* to say that one of the two principles is determination and the other indetermination. The first expresses the identity of the mobile being, the second its receptivity vis-à-vis successive existence. This principle of indetermination must be *pure* indetermination, since any limit would make it determinate. In other words, its proper determination consists of not having one: it is pure potency.

These are difficult words, but unless we halt midway we must arrive at these conclusions. We call the principle of determination *form (morphe)*, and the pure potency has the name *prime matter (prote hyle)*: two terms which do not have much in common with their current meanings. Let us not be victims of this equivocation. We must be careful not to reify beneath each movement a substrate of immobility by taking refuge, not in the order of things where nothing is explained, but in the order of the *conditions* of the real.

One can arrive at exactly the same conclusion by beginning with the problem posed by any real homogeneity whatever. Wherever one encounters a multiplicity of equal determinations from the point of view of determination one must necessarily have recourse to a principle of opposition in the essential order, a principle distinct from that which renders essences real from the point of view of determination.²⁹

Considered in relation to us, mobile being involves a complex essence, because it endures successively and continuously. But to speak absolutely, it endures successively and continuously because its essence is composed. The mobile, essentially unachieved, must pursue its existence and it is, in this perspective, indefinitely separated from itself.

The way in which we have just established the central thesis of hylo-morphism is a little forced, despite its appearance of rigor. An argument of the amplitude of its subject—mobile being as such—must arrive at the conclusion *in omni eo quod movetur necesse est intelligere materiam* as soon as it is a question of movement in the proper sense.³⁰ But, it seems to me, that when one seeks to provide a summary exposition, with duration being so imposing a case, this method is permitted and very economical.³¹

It is understood that in the eyes of the scientist who adopts a formal resolution to refuse all truly philosophical reflection, these principles as well as the problems they seek to resolve have only a barbarous and unaccustomed allure. But it is with the philosophical sense as it is with the sense of humor. All the arguments in the world aiming at showing the humor of a farce cannot make one without a sense of humor laugh. A farce has lost its savor when one has demonstrated its risible qualities. The man without humor will follow our dialectic, but he will not laugh. And already you will no longer have an urge to laugh. Or we will laugh the more at the spectacle infinitely more comic of the man without a sense of humor's grotesque disdain for that which he cannot appreciate.

3. Form and Matter

We have made the foregoing exposition with the exclusive point of showing how different are the notions of matter and form of which we speak in philosophy from the scientific notions bearing the same names.

I will now simply mention several theses which attach themselves immediately to the foregoing.

Prime matter *insofar as it is pure indetermination* unites all material beings in the same matrix which is common to them. It is impossible that there should be several pure potencies. They could only be opposed by some determination. Matter, having no proper determination, cannot subsist alone: it is always associated with a form. It is only given at the outset in a composed thing.

It is again by matter and form that we explain generation and corruption. The cosmic beings which appear and disappear, one after the other and the one from the other, are drawn from the potency of matter by beings already existent, and they are reduced to it by corruption. Prime matter is not a kind of reservoir containing in a latent state determined forms which only await a chance to be released. Prime matter is pure indetermination. Forms can only be contained in it in the manner of possible cuts in an indefinitely divisible line. For natural beings, then, there do not exist forms of structure determined apriori, with the exception no doubt of the form or forms given at the outset, and of the form which will realize the finality of nature as a whole. Moreover, existing forms are by definition determined. Yes, but in the manner of the cuts when a line is actually divided. These forms of existent beings are fixed like whole numbers. Between any two existing forms there is more than an infinity of others possible.

Generation is not therefore in any way a creation, but the act by which a given compound educes another from the potency of prime matter. It is understood that prime matter is created, or rather co-created (since it cannot subsist outside a composite), and that any composite whatever insofar as it is a finite being is a created being. In this respect, the entire universe opens directly on God. But this does not prevent the composite from being generated, and that a created being is its generator.

An important point for the form under which we treat this question is that from the existence of the first composite (supposing that the world had

a beginning in time) all possible natural³² forms were *given* in the potency of prime matter. Hence, no special creative act is necessary to educe them from this potency, provided that there exists some sufficient created cause. And if that created and sufficient cause exists, it is to it that generating causality must be attributed, by virtue of the principle of divine governance by secondary causes.

The principle of sufficient causality requires that the cause in question be at least at the level of the effect to be produced. That is understood. No natural being would have been able to educe from the potency of matter a composite superior to it, unless it is not the principal cause.

Therefore, it is absolutely impossible that any plant should engender any animal whatever, *as principal cause*. Some scholastic authors have held that biological species at the interior of the same philosophical species, defined according to their degree of organization, differ only accidentally. And that within one philosophical species inferior biological species produce higher species.

This accidental difference is an extremely ambiguous thing. Must not the gradualities of the accidental order be reduced to the substance of which the accidents are a function? Let us not be misled by a confusion of the scientific point of view with the ontological, with which we are now dealing. The generator must be the principal cause of the *whole* effect with all its determinate powers.

Form is matter's reason for being: potency is essentially ordered to act. Matter is thus a *need for form*. If it were indifferent to its reason for being, that would be contradictory. We say that matter is a desire for form, not a desire in the order of exercise, but a desire that is matter itself.³³

This desire attains its goal in the eduction of forms, in the generation and achievement of the composite.

4. The Raison d'être of the Cosmos

Mobile being pursues its existence, but it cannot continue to exist in order to have had a history. Its end cannot consist in the pursuit of an existence always infinitely removed, that is unrealizable. If mobile beings existed in order to exist, their reason for being would be impossible: their existence

would even be contradictory.³⁴ Therefore the terminal point of every mobile being must be in itself immobile, a being which, as terminal point, does not have to pursue its existence. It would have a successive existence insofar as it is composite, but it would be outside time because of its spiritual form. And this is the *raison d'être* of the whole of nature.

But a being which does not have existence in a successive manner is a being with a simple essence: its existence will be equally simple. Such a being is not, therefore, educed from the potency of matter; it is given from the outset by a creative act. But if it is entirely given from the outset, natural beings would be superfluous. Such a being would be essentially trans-cosmic, a pure spirit. But the particular end of the cosmos ought to be interior to the cosmos. If mobile being as such cannot be that end since it is only a means, its reason for being is essentially utilitarian. But its existence cannot be useful for a pure spirit. That is why a pure spirit cannot be the *raison d'être* of the cosmos.³⁵

The being in which resides the end of the cosmos must be both immobile and cosmic; both spirit and matter must be found in it, its essence must be composed of a spiritual principle which integrates the cosmos. The essence of the being that is the terminal point of the whole of nature will be composed of a spiritual form and prime matter.

Man is manifestly the *raison d'être* of the whole of nature. Moreover, nature could not be ordered to God except through man. God being the end of the universe, it is necessary that the universe be capable of a return to its Universal Principle—of a *reditio ad principium*. But only an intellectual creature is capable of such a return.

Among beings of this nature, “only rational created nature is immediately ordered to God; other creatures, in fact, do not attain the universal but only the particular; they participate in the goodness of God with respect to existence only, like inanimate beings, or with respect to life and knowledge, like plants and animals. Rational nature, on the contrary, because it knows the universal formality of the good and of being is thereby ordered immediately to the universal principle of being.”³⁶

In other words, only a creature capable of making a tour of being can rejoin the source of being. At this precise point we can identify the terminal point thus *deduced* as the final condition of the mobile as such—with ourselves. We know that our ideas are universal and that this universality implies, from this point of view, a complete independence of the restrictions of matter.

Man is in the last instance the *raison d'être* of matter. If it were essentially ordered to mobile being as mobile, and if the mobile as mobile tends to the indefinite, matter would be contradictory. It is by definition ordered to an immobile form, which alone can be a definite term.

Every creature existing in potency can have no other tendency than to arrive at act by way of motion. So matter, in following its natural appetite, by preference tends toward such an act, if it is the most remote and perfect. Consequently, this natural appetite in virtue of which matter seeks form, should tend, as to the last end of generation, to the most remote and perfect act to which matter can attain.

There are several degrees in the acts of forms. Prime matter is right off in potency to elementary form; reduced to elementary form, it is in potency to the mixed form, because the elements are the matter resulting from a mixture, and are in potency to the vegetative form: for this soul is the form of a body of that nature; likewise, the vegetative soul is sensitive in potency, and the sensitive soul is intellectual in the same way. This is proved by the process of generation: its product begins by being a fetus, which lives in the manner of plants; to this life succeeds that of the animal, and in the third place life proper to man. In the order of beings produced by way of generation and subject to corruption, there is no more remote or perfect form than this last. The human soul is thus the term of completed generation, and matter tends to arrive at this term which is its final form. Thus the elements exist for mixed bodies, and the latter for living bodies: among these, plants exist for animals, animals for man, and man is the end of generation in its entirety. . . .

... If then it is true that the motion of the sky is ordered to the generation of beings, and that man is the term of this generation in its entirety, and as the final end of this genus, it is evident that in the order of beings produced by generation and susceptible to being moved, the [proximate] end of the motion of the sky is attached to the existence of man as to its final end.³⁷

Man, because he is the *raison d'être* of matter, is as well the end of all possible natural forms.

Every natural form tends toward man. The idea of man bursts forth from no matter what form, even from a material point of view. The essential desire of prime matter, which always indefinitely exceeds any form received, is to be actuated by the immobile form of man. And in this perspective, subhuman forms are much less states than tendencies.

Let us consider first of all the scale of natural forms according to the *order of nature*, making abstraction from the order of time.

If one can say in advance and with certitude that matter will receive the human form—without this the existence of no matter what mobile being would be in advance contradictory—one can say as much of the deletion of the scale of forms which rises toward man. The multitude of possible forms is indefinite. In other words, possible natural forms are impossible, like the infinity of possible cuts in a continuum. If one wants to progress, one would have to span the intermediate forms, each bound constituting a clean rupture without any intermediary *in act*. The scale cannot be given in advance like a determinate geometrical figure, to be disengaged from the outline of the lines given. Doubtless the configuration of the scale will be in a certain measure determined by the material given at the origin (there, or the initial forms), but the number and distances of degree cannot be given in advance. The number of steps which cover a journey depends on the length of one's legs, and on the quality of the road.

If each individual form is necessarily determined, the composite also necessarily involves haziness. To say that matter is pure potency is to say that, as such, it always exceeds the form—because the form, itself determinate, does not entirely determine the matter; it cannot be entirely determined *ad unum*. A form entirely determined *ad unum* is by definition a subsistent spiritual form. Moreover, a natural form will be determined *ad unum* in the measure of its perfection, in the measure that it responds more and more to the desire inscribed in matter.

But the margin of indetermination exceeding the form is the root of the contingency in nature. *Causa per accidens est infinita et indeterminata*. The causation of a composite can fail and ought in fact to fail in the measure that its form is not determined *ad unum*. The path leading to man is bordered by the ditch of matter—a ditch more dangerous because the path is, in its beginnings, straighter—but the more one advances, the more forms tighten up and free themselves from the shackles of matter.

Therefore, whatever the initial form given, one will be unable to find in it a rigorous plan. It can show us only a preview of the forms on the scale arising from it. One can say in advance that it must arrive at life, at knowledge, at intelligence, but it is for experimental science to say *how* this world has been molded from the *fluxibilia et non semper eodem modo se habentia propter materiam*. And this role devolves on experimental science precisely because one is unable to make in this domain rigorous deductions in function of the necessary. Science, first of all by its research, tries to reconstitute the path, or the paths, followed *in fact* by nature. But it is also forced—and here is its principal aim—to find essential limits, not doubtless of the plan followed, but of the preview given in advance.

The fixity of subhuman forms is therefore a counterfeit fixity. We are naturally metaphysicians and from that arises the need for the necessary, and in this case, to likening the cosmic hierarchy to the series of whole numbers and to an immobile hierarchy of pure spirits, but these are only analogies. If we are manifestly metaphysicians in our search for the necessary and the purely intelligible, we would delude ourselves in thinking that the necessary should be everywhere realized, and we will show ourselves to be undemanding and poor metaphysicians if we think we see it everywhere realized. And I think I can say that he who wishes to find in this world of fleeting forms absolute immobility does not seem to have a very high opinion of the celestial hierarchy.

Our world is far from being a pure system like crystal and achieved in all its parts like a billiard ball. But if it is opaque, loose and shaky in its first steps, this does not prevent its essential tendency toward the necessity which blossoms forth in freedom—for the necessity of spiritual structures is the root of liberty. The absolute freedom of God flows from His necessity, from His pure actuality, from His absolute determination.

We have said that man is the *raison d'être* of the entire cosmos, and that in him the desire of matter is assuaged. But a man is only an individual of the human species which succeeds by scattering itself in a multitude of individuals (and we will see later the profound reason for this). To speak absolutely, it is humanity in its entirety that is the *raison d'être* of nature. Individual humans are indefinitely multipliable. Nevertheless, an indefinite multitude cannot be an end, *quia non habet certum terminum*. The indefinite is by definition unrealizable. We must therefore say that a multitude of human individuals, numerically definite, is the final end of the cosmic universe.

Was the cosmic hierarchy given in advance, once and for all, or must it wait on time, such that the imperfect preceded the more perfect? And if that is so, where do the most perfect forms come from?

5. Nature

The mobile as mobile tends toward the spiritual form of man. Movement in the world has no *raison d'être* apart from this perspective.

The movement by which each being tends toward its end is proportional to its degree of perfection. But the degree of perfection is determined by form. Under this aspect every form is invariable and immobile, for by definition a form makes a being what it is. If the form changed, and if the form were as such mobile, a being would never be what it is and movement itself would be contradictory. Form is thus *the principle of the diversity of movements*, without itself being a movement.

The desire of matter, while being fulfilled according to the measure of perfection of its actuating form—and in this measure the composite enjoys a certain fulfillment and rest—its essential desire persists unassuaged until it attains the spiritual form of man—let us rather say, of humanity. Matter remains tending, under no matter what natural form, under forms increasingly more perfect. Thus matter is in its turn a principle of movement.

But to be a principle of movement belongs neither to it alone, since it is necessarily associated with a form, nor to form alone, since it is in itself invariable. In order for there to be a *determinate* principle of *movement*, it must be at once matter and form. But matter and form considered thus as the intrinsic principle of movement are called 'nature' in the strict sense. We say 'intrinsic' to distinguish nature from art and chance, the principles of which are extrinsic.

If the perfection of movement is determined by the degree of perfection of the form, this is because form plays the preponderant role in the principle of movement—it is form that is the measure of the perfection of nature.

But no nature remains closed on itself. It is to make this precise that we insist on the notion of nature. "*Id enim per se videtur esse de intentione naturae quod est semper et perpetuum.*"²³⁸ Mobile things do not run along parallel lines to fall like a stone at the end of their journey. That would mean that form is their principal end and that their essential orientation to spiritual

form is accidental, whereas it is their *raison d'être*. A nature is essentially a principle of ascending movement, it is profoundly impulse (*élan*).

But isn't nature a principle of motion, and the activity or passivity of the mobile things, aren't they of the accidental order? Furthermore, isn't the perfection demanded by nature simply of the accidental order? And hasn't any natural being attained its end when it is thus fulfilled?

Let us say that the particular end of natural beings consists in their individual and specific fulfillment in the accidental order. But this particular end is not their principal end. It is true that the more perfect the being, the more its particular end coincides with the principal end. But mobility is essentially function.

Matter and form are essential, not accidental, principles. But it is these essential principals which tend toward spirituality, and accidents are only instruments of substance. Should one say that the composite finds its *raison d'être* in the actuation of accidental powers, that would say implicitly that substance is for the accidents, and that a subhuman being is principally loved for itself.

But let us not conceal our unease that we have closed our eyes to these logical consequences. We are reluctant to see nature as an ascendance toward more and more perfect form from imperfect forms, to see it proceed temporally from the less to the more perfect. We remember a principle that St. Thomas applied to the whole of nature.³⁹ If we cannot follow Thomas, isn't this because we have excluded from the universe the efficient and sufficient cause to start the cosmos and push it to the height? Our frightened attitude can be easily explained. Suarez has resolutely shut off the world at the top: we want to explain everything in nature by intracosmic causes. Suarez, in denying the apodictic force of the arguments presented by St. Thomas to show in a strictly rational way the existence of pure spirits, cuts every essential link between the cosmos and the created spiritual universe. Add to that his hybrid notion of prime matter and we come logically to the barbarous creationism of our manuals of philosophy. It is understood that if we sterilize the world at its beginning, nothing further can result. Creationism, which opens the world directly to God, bypassing the universal hierarchy, implicitly rejects what is essential to the universe: the unity of order.

Since Suarez, scholastics have abandoned more and more resolutely the ontological point of view in the explanation of nature. One imagines that scientific explanations replace the philosophy of nature and one retains only

what is directly useful for theology. But, if in astronomy cosmic repulsion sufficiently explained the expansion of the universe, and the theory of genes puts us on the way to explain mutations—and it would be ridiculous to call them insufficient from a scientific point of view, which in its fashion constitutes a closed domain—none of that could explain the simple displacement of a material point from an ontological point of view. For that, one cannot have recourse directly to the general notions of metaphysics, we must find the proper causes. If I have a headache because God wishes it, that does not prevent me from attributing it to a too long night and accepting that an aspirin might relieve it.

I say that no intra-cosmic cause can give me an ontological explanation of the movement of the moon, not because the movement of the moon particularly interests me in philosophy of nature, but it is the movement of an inorganic phenomenon and it is as such that I consider it.

6. The Inorganic World

In opposition to what materialists think, speaking *formally*, we know life better and more immediately than non-life.

When St. Thomas wants to show the foundation of the certitude of philosophical biology, he is precise: "Certa est, hoc enim quilibet *experitur in seipso*, quod scilicet habeat animam et quod anima vivificet."⁴⁰ This science is certain because everyone experiences in himself that he is living and thus he knows soul as that which makes us living. But this experience is the point of departure proper to the science of life. St. Thomas does not speak there of the life we observe in others, for if the life of another were as such immediately grasped, it would suffice to say *hoc quilibet experitur*. But since the life of another is not immediately known to us, he adds *in seipso*. If it were that of others, one could be mistaken, and it often happens that we are mistaken, as in the many cases we cannot decide whether we are dealing with a living or a non-living thing, with a vegetable or an animal, or as sometimes happens when a work of art gives us the illusion of life. We can only grasp the life of another by means of the *signs of life*.

I am conscious of my vital activities: I think, I will, I sense, I raise my arm, I speak, I walk, etc. These activities are *mine*, I am their principles. But these

activities involve objectively observable signs that I connect directly with the activities. But when I find elsewhere similar signs quite independent of the observable signs of my own activities, I attribute them—for they are signs—to a life other than mine, to another subject.⁴¹

If we have a positive knowledge of life, we do not have that kind of knowledge of non-life—such knowledge would be for us manifestly contradictory. When, while remaining within the pre-scientific point of view where we have placed ourselves, we have to do with something real which gives no sign of life, it would be manifestly absurd to attribute life to it. Such an attribution would be entirely gratuitous and void of sense. Such an affirmation could not arise from experience. It *postulates* that life is coextensive with being, a postulate forever unjustifiable.

But if the principle of hylozoism is in advance indemonstrable in an order where the necessity of demonstration is at issue, it is not a matter of an affirmation which gratuitously postulates more than is necessary to explain the negative phenomenon in question; and even if we know only phenomena which presented signs of life everywhere, would we be able to prove from that that non-life is impossible? Hylozoism always has in its favor manifest vital facts, whereas the materialist who sees in life only a pure epiphenomenon right off puts himself in a point of view that we only attain in a negative manner, that we define by exclusion of that which is attained first off and by experience. How else could we define *non-life*?

And once the materialist principle of the priority of non-life in our knowledge is conceded, it will be forever impossible to arrive at anything but the non-living. The living will only be constructed from the non-living.

Of all the vicious circles one could imagine, that in which the materialist encloses himself is the most primitive, restrictive, and binding.

If non-life is essentially obscure, vegetative life is also for the most part obscure. In it we do not touch ourselves as in conscious life. Although life, which we know immediately in our activities, involves as an *essential attribute* a certain interiority—we know these activities both as *emanating* from the subject and as interior to him—the *signs of interiority* manifest in ourselves, although unconscious, and equally manifest in what we call plants, oblige us to attribute to them some degree of interiority by vital definition.⁴²

If on all these points we are in complete agreement with many modern philosophers, we resolutely separate ourselves from them when it is a matter

Science is important to locate proper causes which

of the formal object of philosophical biology. For if it is in myself that I touch life the closest, and if that more or less intimate knowledge of my own life—knowledge which is moreover conditioned by an *object* of sensation, of thought, of will—permits me to recognize life elsewhere, it is not this life that I make the formal object of the philosophical study of life, no more than I take the paper on which I am now writing, as this paper, as the point of departure of metaphysics, but simply this paper as being. My life as *mine* cannot be the object of a science, even though it conditions in an extrinsic manner my science. The role of my life is thus analogous to the role of my thought in my philosophy.

If interiority, self-movement ⁴³ is the essential character of life, we ought to define the non-living by denying of it all interiority. It does not move itself. All movement comes to it from without; it is moved and can only move insofar as it is moved.

But before discussing the consequences that this definition has for our subject, I would like to make clear a point which seems to me too often neglected. If we know how—at least in very many cases—to identify a living thing and to say that it is a substantial whole, ontologically distinct from its surroundings, one cannot say as much of the non-living. Is a rock a substantial being because it is in a certain way distinct from its surroundings? Is it spatial separation that provides the criterion? But what then of atoms? Is not man from the point of view of the physicist above all a void in which are scattered rare particles? Can I not sit down on two rocks at the same time and cannot two men ride one horse?

I know of no criterion that would show the ontological cuts of the inorganic world. I do not say either that such cuts do not exist: that would be an equally gratuitous assertion. I only say that I have no criterion to discern them. And I add that I see nothing more unfitting in an inorganic world, substantially one in which innumerable living things vegetate, than in one tree on which insects munch the same leaves.

The inorganic world is essentially moved. Whatever be the exchange of movement which takes place in it, the movement cannot have its active principle in it. Not that the inorganic world is not one, or some natures, in the strict sense—for our definition of nature was large enough to accommodate a being that is natural even if it only has in itself a passive principle of movement. One cannot say otherwise without falling into hylozoism.

These considerations are completely deprived of sense from the point of view of physics, but we speak here of movement from an ontological point of view, which we define as a passage from potency to act. But the inorganic world has in it no active principle which would enable it to move itself, to reduce itself from potency to act. Potential energy which releases itself, or the spontaneous disintegration of radioactive bodies, which are sufficiently defined and explained by the experimental method, make no philosophical sense.

It is granted that no movement whatever can have as ultimate efficient cause anything other than an unmoved mover. But when it is a matter of a particular species of motion, the proper cause must be sought. But, the motion in question—that of an inorganic being—is motion in the strict sense, and implies as potential substrate matter.

The act of inorganic being cannot be cause of its motion—that would make it living. Therefore, it is necessary to look beyond it, not only because the inorganic is in fact in motion, but above all because to the passive potency of matter—essentially ordered to a form—there must correspond an active power sufficient to realize its reason for being.

This active power is necessarily the power of a living thing. But this living thing cannot be intracosmic for two reasons: first, because the motion of the inorganic world is necessarily presupposed for intracosmic life, and, in the second place, because it is prime matter, the potency of every natural being which as such and in advance calls for this corresponding active power.

Every passive potency has a corresponding active potency; for [passive] potency exists for the sake of act, just as matter exists for form. But, a being in potency can never arrive at act save in virtue of another which actually exists. Therefore, [passive] potency would be useless if there were not an agent endowed with an active power which can bring it to actuality. But there is nothing useless in nature, and consequently, everything which, like matter, is in potency relative to generation and corruption, can only arrive at act by means of the active power which resides in the heavenly body which is the first active principle of nature. But, just as the celestial body is the first agent with respect to inferior bodies, so God is the first agent for every created being.⁴⁴

We know moreover that the celestial body was in its turn moved by a separate substance, by a pure spirit. If we have, centuries since, abandoned the surpassed astronomy implied by this text of St. Thomas, we have wrongly rejected the philosophical idea beneath the argument. If we cannot point to the intracosmic instrument which serves as the being endowed with the active power necessary to the cosmos, we are no less obliged to affirm its existence.

By that argument we do not mean to establish the identity of this cause—is it God or a created transcosmic being, a species of demiurge? But it does show that the cosmos is open to another world which acts on it. And this cause can only be a living being; it is necessarily a pure spirit, a transcosmic being. For if we placed it within the cosmos, the same problem would arise again.⁴⁵

And if the pressure exercised on the cosmos is spiritual, from whatever being it come, it sufficiently explains the ascendant movement demanded by nature.

If the cosmos is thus essentially suspended from the spiritual universe, this does not prevent the tides that rise in it from being natural. It is natural for the world to receive its impetus from above. A nature that has in itself only a passive principle of motion is nonetheless nature.⁴⁶

The spiritual impulse exercised on the cosmos cannot bear directly on prime matter, since it does not have in itself any consistency, and is by definition associated with a form, but on a composite being. Moreover, the pure spirit cannot be the form of a matter. Acting on the cosmos, he unfolds it according to laws inherent in the cosmos, just as the sculptor submits to the exigencies of stone in order to extract his work. But the pure spirit acting on the world does not make a work of art. His influence brings forth natures.

It is hard to keep one's mind on this level and not give free rein to imagination which could falsify the idea. I can imagine nothing more grotesque than the image one would come up with by confusing with the experimental point of view this strictly ontological point of view to which nothing answers on the side of science. The universe of the sciences, if science there is, is necessarily closed on all sides. Equations must find equilibrium within themselves. But already the image of the entire cosmos as essentially ordered to man would appear grotesque from the perspective of the astronomy which provides him a poor little planet born of a catastrophe. It is not yet the moment to take the measure of man.

If in philosophy of nature we close the world at its summit, we will be spontaneously led to explain everything from below. The first evolutionists had the world begin from chance, the imperfect was the unique and principal cause of the more perfect. And Haeckel derived a diabolical pleasure from seeing the world emerge from nothing.⁴⁷

7. The Definition of Soul

The vital activities of which I am conscious flow from my substance.⁴⁸

Every substantial form immediately actuates matter. Thus the form of a living thing is the act of a matter. But the form of the non-living is also the act of a matter. How then can we differentiate between these two species of form?

Let us call *soul* the principle of life that we seek to define. We will say that we are dealing with the corporeal in the narrow sense when we encounter no sign of life in a being. Still, the definition of soul cannot be "form of a body."

We have just made use of a singularly ambiguous term, 'body.' The chemist speaks of simple bodies, of heavy bodies, rocks and stars are called bodies; the physiologist speaks of the body of a cell, of the human body, etc. How to understand this in philosophical terms?

Spatio-temporal beings, such as a dog, a cabbage, a man, are exterior to one another in a homogeneous manner: there exists between them a spatial opposition. But they are not only exterior to one another, they are in a certain way exterior to themselves. The tail of the dog is exterior to its head, one vertebrae in his tail is exterior to another, etc. However, all these parts exterior to one another belong to the same subject and are integrated in it. It is the whole thus distributed that we call a body, and a substance is called corporeal in the measure that it is the root of such dispersion. Moreover, each constitutive part of this whole can be called a body by extension and in an improper sense, in the measure that it is in its turn further divided or divisible.

A homogeneous exteriority is quantitatively measurable. The parts compared among themselves define a magnitude. The body of which the philosopher speaks must be rigorously distinguished from the body as one can speak of it in experimental science. If any exteriority is as such measurable, it is only experimentally defined when it is measured. The physical body is only defined

by the description of its process of measurement. A physical body defined as "a cube with four sides" is a bundle of number-measures translating different comparisons which have been made on a given object. The dimensions in question are the result of measures of which three were established by a standard of length arbitrarily chosen, and the fourth, time, by a watch, for example.

The point of view of the philosopher is prior to all that. Not that it is in practice possible to perceive an object without spontaneously making comparisons vaguely defining the sizes, but this formality is not the aim here: it is not a matter of body either as *measurable* (the material subject of experimental science) or as *measured* (the formal subject of experimental science).⁴⁹ In the philosophical sense, it is a substantial whole which involves parts external to one another in a homogenous fashion.

Having thus defined body, it is understood that the dog, cabbage, and man are so many bodies. However, since life is essentially an interiority, a living being cannot be just a body.

What in fact does differentiate the body called inorganic from the living body? We have just said that we will base ourselves on *signs* to discern the one or the other. Let us dwell for a moment on a manifestation of life such as it is attained by the philosopher. I see yellow, I feel warm. These sensations are as such incommunicable. It is impossible to make one born blind understand what yellow is, of what is sight. Moreover, I cannot myself define them. But if I cannot communicate to another this intimate experience, nor receive that of another, I can place myself in a point of view where everything becomes perfectly communicable. A blind man can understand optics perfectly and understand the mechanism of sight, and a hypothetical subject anaesthetized to the sense of temperature, could still understand as well as another what is physical heat. However, when we have defined heat as the kinetic energy of molecules, we have from that no knowledge in any way of what it is like to feel warm. It is at this precise point that one notices the inconvertibility of the two points of view. If I know perfectly that a sensation of heat corresponds from the physicist's point of view to a molecular bombardment, and if I know perfectly the physiology of the sense which is its object, I would never know *why* such a physical phenomenon provokes in me such a feeling. I would never be able to derive the inside from the outside.⁵⁰ But it is to the point of view of that physically untranslatable intimate experi-

ence that philosophy must hold itself,⁵¹ and it is from this same point of view that one must explore the external world. But my sight is manifestly associated with some observable object—the eye. I know, nothing seems vaguer than the organs of which the philosopher speaks. The physiologist could very easily provoke a visual sensation in an individual deprived of eyes in the anatomical sense. However, from the philosophical point of view, the point excited, whatever it is, would still be the *organ* of sight.

So it is with all the organs of the living thing. Clearly, the philosopher is indeed obliged to place himself outside, but this outside has no sense for him save in the measure that it is seen from within. And if this method is perfectly sterile from the scientific point of view, it is the only fecund one in philosophy.⁵²

The organs and their function thus recognized as observable manifestations of life enable us to differentiate the living body from the inorganic. The living body is an *organized body*, and is that much more alive when it has a more differentiated organization. The vital functions seem to demand from the side of organization an always increasing complexity, a more and more pronounced heterogeneity.

The body as body requires no heterogeneity—on the contrary: it is a body only insofar as it involves homogeneity.⁵³ The more life is intense and compact, the more it requires organs differentiated from one another and in themselves, and the more the body is removed from pure corporeity.

These few considerations enable us to define the principle of life. Soul—the substantial form of the living things—is *the act of an organized body*.⁵⁴ Not that the substantial form informs an organized body. Form can only actuate prime matter. The organized body is rather the result of the informing. But then, why not say that the soul is a form such that when it actuates matter an organized body results? A definition need not necessarily trace the order of discovery that justifies it.

The reason for defining the soul by organized body is more profound.

Corporeal organization is only a sign that permits us to recognize life: this organization conditions life ontologically. In fact, if the organization of the body is constituted by the actuating form, the composite of matter and form has been engendered—it is the composite and not the form alone which is the term of generation: *generatio non est formae sed compositi*—a composite which involves *actuated* matter, that is, determined by its form.

For the matter of the composite is not pure potency with respect to the form that actuates it, but with respect to the possible forms of which it is deprived. And if the form is the act of matter, it is not the actuated matter. Let us say that every form is proportioned to its matter: *omnis forma est proportionata suae materiae*.

If the actuated matter (and in another respect further determinable by other forms) and its actuating form are the intrinsic and constitutive causes of the engendered composite, their composition is produced by an extrinsic agent. Generation consists in the production both of a determined matter and of a determining form—the two constituting the composite.⁵⁵

These are two perspectives all too easily confused. The generation that is cause of the composite is implicitly cause both of the actuating form and of the matter, and of the determined matter, although in the engendered composite form is the cause of the determination of the matter—matter having *of itself* no proper act. If in the perspective of the generating act the agent were cause only of the form, the composite would be its own efficient cause: matter and form would be generative the one of the other, the form would be the act of a pure potency. Thus, from the perspective of efficiency, the *disposition* of the matter conditions the form—the form can be act only of a matter disposed by the generator, a disposition of which, however, it is the cause in the order of formal causality.⁵⁶

8. Disposition, Alteration, Generation

How is the disposition conditioning the form realized? Does it precede form in the order of time? “In the way of generation,” St. Thomas says, “disposition precedes the perfection to which it disposes, in beings which are perfected successively.”⁵⁷ “A perfectible is united to its form only after a disposition exists in it which makes the perfectible receptive of such a form, for an appropriate act comes to be only in an appropriate potency: thus the body is united to the soul as to its form only after having been organized and disposed.”⁵⁸

How can the body precede the form which actuates it? The human body is only a human body by the form which actuates it. And, on the other hand, how can one distribute this disposition in time when the generation of a composite is necessarily instantaneous? In fact, substance, being that which

makes a being what it is, is indivisible, invariable. *Substantia non suscipit magis vel minus*.⁵⁹

Every generation presupposes a given matter. It is in this that it differs from creation. Prime matter is given only in a composite. Therefore, every generation presupposes as point of departure—*terminus a quo*—a given composite. The generator cannot act directly on prime matter, this does not exist as something separate. Generation consists in transforming a composite into another. Not that the form of composite *A* is changed to the form of composite *B*, since every substantial form is by definition invariable; but from the potency of the matter of composite *A* the form of composite *B* is extracted.

If matter is *of itself* potency to any form, the composite which is *terminus a quo* of a generation cannot be just anything—which would be to say that it is prime matter, pure potency. In the present case, matter is the potency of *this* composite, and in this respect, this composite measures its potency for the composite to be engendered. If from no matter what no matter what could come to be, every generation would be a purely chance phenomenon, which is contradictory. Just as the matter the sculptor uses cannot be just anything, so it is necessary that the composite be disposed in a determined manner which renders it capable of being the point of departure of the generation of a new determinate composite. And just as the matter that the sculptor uses must be determinate in the measure that the work he conceives is more perfect—such an idea should be executed in granite, not in marble—it is necessary that the composite which is *terminus a quo* be that much better disposed insofar as the *terminus ad quem* is more perfect.⁶⁰ The composite which is *terminus a quo* should cede to, should disappear before, the composite which is the *terminus ad quem*, by being, not annihilated, but reduced to the potency of matter. That is what corruption is. When the chromosomes of a spermatozoid (envisaged here as signs) are united to those of the ovulum and a new being is born, the spermatozoid and the ovulum are corrupted—even if the chromosomes of the new being are the same from the experimental point of view, and one has followed them on the track to their new ensemble.⁶¹ And when a dog dies, thus giving birth to other composites, it is reduced to the potency of matter. The form of the dog being indivisible, it either is or is not. It is not its form that can be almost a canine form. From this corruption results necessarily a generation, since matter

cannot for even an instant be deprived of a form, being by definition the potency of a composite: to be corrupted is to be reduced to the potency of another composite. Otherwise corruption—which is not an annihilation⁶²—would be the generation of prime matter, which is by definition ingenerable.⁶³ Since on the one hand substance is the root of the accidents of the composite and on the other its substantial form can only immediately actuate prime matter: *quod fiat resolutio usque ad materiam primam*. And yet, if this resolution is integral, it is necessary that there exist between the composites a relation of mutual dependence, since the engendered comes from a composite, which cannot corrupt without engendering it. The generation of the one and the corruption of the other are so intimately linked that they must take place *simultaneously*. In fact, generation and corruption are necessarily instantaneous, since the substance engendered or corrupted is indivisible. Hence, corruption and generation, even while being essentially and formally distinct, cannot be separated by an instant in which the subject of the transformation would be neither the composite *A* nor the composite *B*—which comes down to saying that there would be an intermediate instant during which only the pure potentiality of prime matter would exist, which is impossible. Generation and corruption are therefore simultaneously realized. And still in this respect, the generation of the one is the corruption of the other, depending on the direction one looks. *Idem est in quod terminatur corruptio, et ex quo est generatio*.⁶⁴ If in this perspective generation and corruption are instantaneous, we must nevertheless find in the composite *A* and prior to its corruption, a reason for that corruption. Otherwise, its very being would be by definition a disposition to corruption. If every being composed of matter and form is as such corruptible, corruption cannot be its *raison d'être*. And the corruptible substance cannot be *in itself* successively more or less disposed to corruption, since its form is invariable. When a composite is said to be disposed to corruption or to generation, this disposition taken formally can only be of the accidental order, even though it involves the corruption of the whole. The animal dies from old age, from sickness, of some accident which, wherever it comes from, intrinsically affects the whole. These accidental affections dispose the whole to corruption, and implicitly to the generation of one or more composites. And that a disposition of the accidental order can have substance as its term should not astonish, since accidents are a function of substance. They are its instruments. The active preparation for

generation and corruption which involves enrichment or regression is in the accidental order, an order whose term is however substance: it disposes the subject.⁶⁵

If the substance of any being whatever is indivisible, the dispositive qualities are present in a same subject according to different measures: *suscipiunt magis vel minus*. These accidental changes which affect the whole, which have a repercussion on other accidents and which touch the substance, are called *alterations*.⁶⁶ It is in alterations that a composite is disposed, or disposes another, either to generation or to corruption, according to the direction in which one regards it.

Alteration is therefore a progressive movement in the perspective of generation, regressive in that of corruption. And if the disposition that brings it on is itself of the accidental order, its ultimate end is in the substantial order. Entailing fatally a corruption, its ultimate end is nonetheless always a generation. In this order, alteration has a double term *ad quem*: one is the disposition which will necessitate the generation, and the other the substantial form of what is generated.⁶⁷

Alteration, St. Thomas tells us, is a continuous motion. But the *whole* of alteration is not. The whole contained between its proper substantial subject and the ultimate disposition toward which it tends is constituted of discontinuous moments which are nonetheless continuously linked among themselves like the actual cuts in a continuum. Moreover, what St. Thomas calls the *tota alteratio*⁶⁸ takes place by jumps, by a series of ruptures of the same species which come about in the same subject.

The disposition of which we speak is of the accidental order, however the whole of the composite, including substance, has to be disposed with respect to the composite to be generated. We say that in the dog there is a disposition to engender or to die, and that in a plant there is a disposition to be assimilated whereas there is nothing of the sort in a brick.

And if we understand in generation not only the instantaneous act in which a new composite is generated, but also the dispositive preparation by way of alteration, we must see in it a veritable *factio* in which the generated is modeled,⁶⁹ a formation parceled out in time. A living being is under construction before it exists.

When the composite *A* is disposed, and when from this composite is generated a composite *B*, is there a transmission of the disposition, is it the

same in the two? Let us take the classic example of the cadaver which has all the signs characterizing the individual who just died. Are we confronted with the same signs? Do we not say that this is the cadaver of such an individual? Would there be perfect discontinuity between the nose of Mr. X and the nose of the cadaver to the point of not being able even to say that nose *was* the nose of Mr. X?

From an experimental point of view, the configuration of the nose has not changed, but from an ontological point of view it is absurd to say that the nose of the cadaver was the nose of Mr. X, since there exists between composite Mr. X and the composite cadaver, a substantial opposition, a perfect ontological discontinuity. But the substance is the root of the accidents of the subject. Therefore, if the composite *B* is absolutely other than the composite *A*, to the point of not even being able to say that *B* was *A* (which would pose the impossible case of two substances being one), a fortiori, the nose of the cadaver cannot be that of Mr. X.

But let us not exaggerate this discontinuity to the point of forgetting the profound relation that links the two composites even from the ontological point of view (and which moreover shows us the foundation of what one observes from the experimental point of view). The generator is truly an efficient cause of the engendered, he models it in advance, and gives it independent existence. What the generated possesses, and which is in no way the generator, nonetheless comes from the latter. Everything is in this formula. And in this respect, the characteristics of the composite *A* are the same; and yet they are numerically different since they belong to substantially diverse subjects.⁷⁰ In this quite fundamental perspective, we must say that the cadaver is that of Mr. X. All beings thus bear the traces of one another.⁷¹ Every composite of matter and form is essentially corruptible.⁷² No individual form could assuage the desire of matter. Under every actuating form matter remains open to other forms which it cannot take on without losing that which actuates it. But corruption is not the end. Every corruptible is a function of something else: non-being cannot be the end. Corruptibles are naturally sacrificed to future generation. Thus it is necessary to say that every apparent regression is a function of a new generation. And by new generation we do not mean a renewed generation. For if natures tended only to perpetuate indefinitely by pure multiplication, they would pursue a contradictory end, since the indefinite is unrealizable.⁷³ Therefore, perpetuation cannot be the end. It is necessary that the whole process come to rest at beings at once en-

gendered and corruptible in one sense, created and immortal in another—humanity.⁷⁴

From the corruption of a being there often result composites of a lower level. Must we conclude from that that in this respect nature tends to annihilate itself, and that corruption outweighs generation? This is an artificial perspective. It isolates natures whereas they are profoundly coherent, and if it is an evil for a specific and individual nature to corrupt, being given that it is a function of the ensemble, that it is essentially at the service of *natura universalis*, its corruption can be a good for the ensemble.⁷⁵

9. In Perfectible Things, the Imperfect Is Temporally Prior

How far does this principle extend?

A being whose essence is composed of matter and form can only have a complex existence successively realized. The unachieved character essential to everyhylomorphic substance is the cause of time. Moreover, no cosmic being could pursue its own existence as an end, since it would then pursue an unrealizable indefinite.

Thehylomorphic substance is perfectible from the point of view of essence, since no form can assuage the tendency of matter to other forms, a tendency which is the very nature of every cosmic substance, even of that which does involve an active principle of movement—the inorganic. If a nature were achieved from the point of view of essence, it would not behylomorphic, and from that it would follow that it would not be nature in the strict sense.⁷⁶ A simple essence, it would have simultaneously its existence, its duration would not be continuous nor successive, it would be above time, it would be a perpetual thing—in *perpetuis non differt esse et posse*.⁷⁷ Thus the successive and continuous duration is above all a sign of the qualitative enrichment of universal nature. To speak absolutely, it is this very enrichment that ‘takes time.’⁷⁸ Every nature tends to surpass itself, since of its very essence it is ordered to ever higher forms, until attaining an essentially immobile term. The very essence of the inorganic is ordered to this dilation. Aren’t all possible natural forms contained in the potency of matter?

The higher composite extracted from the potency of matter will be new, not only from the point of view of existence, but above all from the point of view of essence, from the quidditative point of view, the point of view of

intelligibility. We have already said that natural forms are contained in the potency of matter only in the manner of possible cuts in a continuum.⁷⁹ These forms are not quiddities: it is matter and form which constitute the quiddity of the composite.⁸⁰ And such a determinate essence is ipso facto existent. If possible natural forms were quiddities, matter would be act from the point of view of essence; and if forms were quidditatively achieved in the potency of matter—which is manifestly contradictory—they would be at once in act since matter is *real* potency, as opposed to pure possibles. And again this existence would be as simple as that of pure spirits. Their duration would be neither successive nor continuous. Such forms would constitute perpetual things: *in sempiternis non differt esse et posse*—an adage whose consequences Bergson seems to have grasped better than we. Natural essence ought to be *made*, not doubtless in the manner of a work of art, since we are talking of natures, of beings which advance by an inner impulse.

The ascendant movement of natures constitutes nonetheless a tendency toward more and more compact essences, more achieved, more and more simple, necessary and intelligible: a tendency toward simple existence. In fact, man is the term of this pursuit, man who in his spirituality is already above time, man whose simple spiritual form already involves a simple existence.⁸¹

The higher composite is not absolutely new with respect to the composite from which it was extracted—it was given in the potency of matter, which excludes both univocity and equivocity: two extreme determinations which destroy the very notion of pure potency. If there were univocity, matter would be in potency to only one species of composites; if there were equivocity, the composites of different species would have nothing naturally in common. Matter links all the composites in the same material genus. The new composite always contains virtually the perfections of the preceding one that it goes beyond.

Novelty is realized moreover in well-defined extreme limits: the initial composite, given at the beginning of the cosmos, and man. All intermediary forms bear profound traces of these extremes, as the arms of a statue bear the trace of the chisel, and of the ensemble of which it is part. Nature advances with spontaneity, like the unrolling of a fugue, which is that much more free because it is more determined.

No doubt, the individual form of a composite is invariable, an evolution of substance is impossible. But it is not only the form which is nature,

for a form, considered outside its relation to matter, is no longer nature in the proper sense. And yet, there must be an ascendancy in the substantial order. We know in advance that this ascendancy could only realize itself in a discontinuous succession of ever richer substances, by essential and profound ruptures (*usque ad materiam primam*).

But how to establish between them this profound link that permits us to say that higher substances are drawn from lower? The dynamic ascendancy of natural beings is formally realized in the dispositive alterations. If an evolution of one substance ordered to another is impossible, the composite whole is capable of enrichment which disposes it to a higher whole.

Without doubt, an ascendancy is already realized in the most elementary of vital functions, nutrition. Grass assimilates air and water, the cow assimilates the grass, and man the cow. (The most hardened fixists will not carry resistance to the point of saying that cows must eat cows in order to generate cows.) But this cycle remains closed on itself if there has only been the inorganic, plants, animals: the world would be open only to individual multiplication. Such an ascendancy is not realized by the internal drive of lower natures ordered to higher, but by an attraction from on high to which they passively submit. In other words, in this hypothesis of a cycle closed on itself in time, the perfect must precede the imperfect, not only in the order of nature (an incontestable necessity), but also in the order of time—they must at least coexist. The idea of progress is thus reduced to purely quantitative increase. But that is a type of evolution which is at bottom only a dispersion, a regression.

It is understood that an individual composite cannot of itself produce alterations which end in a composite of a higher order. Accidental capacities are measured by their determinate and invariable substance. And yet, nature demands an ascendancy by way of alteration. How can this be realized without an already existing higher natural substance?

We have come again to this conception of a spatio-temporal universe closed on itself, and having *as cosmos* no extra-cosmic cause. Already the inorganic world requires us to appeal to a spiritual pressure which causes unfolding without itself being an active principle of motion: not a univocal cause, on the level of the effect, but at least an equivocal cause,⁸² a higher substance which contains virtually the perfections of the whole inferior to itself, which is more potent and efficacious than all subordinated causes.

No being which acts in conformity with its proper species seeks to realize a form higher than its own, for every agent tends to produce a being that resembles it. But the heavenly body, insofar as it acts by the movement proper to it, tends to realize the ultimate form, that is, human intelligence, which is of all forms the most noble, as we have shown. Therefore the celestial body does not act in conformity with its proper species and in the role of principal agent to produce the generation of beings, but its action is determined by the species of a higher intellectual agent, who is the principal agent and of which the celestial body is only the instrument. But, the action of heaven by which it produces the generation of beings consists in the motion it receives. Thus the mover of the celestial body is an intellectual substance.⁸³

This same pressure *naturally* exerted on the cosmos—since natures themselves demand it and a nature is not only a form—suffices to extract from the potency of a composite given at the origin all the forms necessary to achieve the goal. And since this pressure is natural, it must act on natures according to the laws inscribed in them. In this ascendant movement, by which more perfect beings are drawn from imperfect composites,⁸⁴ the given and intracosmic composite is only an instrument, the spiritual agent being the principal cause. Spiritual pressure would not extract any nature whatever from no matter what composite. The instrument, even while producing under the influx of the principal cause and effect superior to itself, entails however essential limits. The more perfect the engendered substance, the more perfect instruments will they be in their turn.⁸⁵

This eduction of forms would not come about with regularity and economy, whatever the perfection of the principal agent, being given that the impulse is given according to the natures. But a nature is never entirely determined to the point of excluding chance and deviations, which are, paradoxically, natural consequents of the nature.⁸⁶ The ascendance cannot describe a single trajectory. It entails deviant ramifications and failures.

What paths have been followed in the execution of this work? What were the steps? What species have arisen in this journey of the whole of nature to man? Without doubt, one cannot deduce them in a philosophical manner, since the ways of nature lack rigor. It is for experimental science to find the traces, to reconstitute the ways which have in fact been followed, and to deduce from them those which ought to have been followed to attain the

end actually realized. If we cannot predict on the basis of the initial composite all the species that emerged from it in order for it to attain its goal, the indetermination inherent in nature cannot impede our predicting with certitude that evolution *ought* to arrive at man. For if there is only probability in the intermediate ways, the term is certain and defined: it is the *raison d'être* of all that has been made; that is, if evolution, despite the deviations and lost efforts along the way, did not arrive necessarily at man, prime matter, nature, all the work that was done, would be in advance contradictory, impossible. It is nature that tends toward man, not chance.⁸⁷

We ought not however seek the intention of nature exclusively in the limits of the torturous road which leads to man, nor to consider all the branches which left the road (and sometimes rejoined it later on) as pure failures. If the fundamental idea of nature was a parsimonious and determinist idea, it would certainly be so. But it is essentially liberal and magnificent, it has a horror of calculation.—We will come back to that.

If we reintegrate into the cosmos spiritual activity which works it in its rising movement, we do not follow the ancients who saw only spontaneous generations (already an improper term) popping up everywhere. It is for experimental science to find where and in what conditions life appeared. Let us add nonetheless that the passage from the inorganic to the organic would probably never be definable from the scientific point of view, the two are as irreducible as physics and biology.

Is there any need to say that this conception does not question the adage “*omne vivens ex vivo*,” a principle necessary in philosophy? What we do reject here is that the living terminus *a quo* must be a univocal cause. The principal cause of cosmic life and of its rising line is neither of the same species nor of the same natural genus, but it is nevertheless a living being.

10. Soul, the End of the Body

What is the proximate end of this rising movement? What is it destined to realize, to extract from the potency of matter? The human spiritual form to which every body is ordered, either mediately or immediately, as such demands the body which responds to a need inherent in the imperfection of this spirit. If spirit is of its essence tending toward body, this is because it cannot exercise the activities essential to it save as a spirit in a body—

because its intelligence and will cannot be actuated by themselves, because they do not have their act naturally, because they have to be stirred up from without. Such a spirit is *naturally* ordered to a body: it is naturally a form of a matter with which it constitutes one substance. Human intelligence, the lowest of created intelligences, considered in itself and in its origin, is empty of all content—a *tabula rasa*; it is so to say totally turned outside itself, it has no innate knowledge like the pure spirits; it is the natural weakness of our spirit which is the reason for our body. Empty of every object, even empty of itself since it cannot not know itself save in knowing an object distinct from itself, it must seek gropingly its object outside; which supposes both homogeneous exteriority (that is, corporeity) and passive experience in the knowing subject (since intelligence is impassible, that is, no lower thing can act on it). In other words, matter and sensation are necessary for it, not in the exercise of its proper activities, but as extrinsic and essential conditions of thought. Human intelligence cannot confront things which are light, which are intelligible in act; spiritual things are that much more hidden in its regard insofar as they are more pure and present. The Being that is closest to it, even infinitely closer than it is to itself, and which is Light per se, is also the most hidden because of the weakness of our sight. Aristotle compared our spirit to a bat. The day of discursive intelligence needs the night of the “outside” and of animality; the shadows of corporeity are born from a need for light. As the astronomer must await the dark to see the stars, although they are equally there in the daytime: it is at night that we see the sky.⁸⁸ To speak absolutely, prime matter in its very essence answers to the need of spirit; the body is implicated in the idea of soul, it is in the soul rather than the soul in it.⁸⁹

The body is like an instrument that enables the spirit to exercise its proper activities.⁹⁰ But the human soul cannot be the form of matter formed just any way. It presupposes on the side of matter a given disposition which necessitates informing. No doubt this disposition given in advance is not that of a human body, since the body is human only because of the spiritual form which actuates it,⁹¹ but it is immediate disposition *to* the human body. It is this immediate disposition that the whole of nature brings about under the spiritual pressure exercised on it according to the laws of nature.

The soul can be the form only of a particularly disposed matter. This disposition is realized in an inchoative fashion to the degree that one goes

up the scale of plants and animals. The soul does not inform a matter disposed only to vegetative life, the matter must be disposed to the life of knowledge, to be subject of an intellectual form. If matter were itself immediately disposed, all human forms would be realized right away since the ultimate disposition is *necessitating*.⁹² It is moreover contradictory, and on the side of matter pure potency, and from the side of “all the possible human forms” that are compossible.

It must indeed be granted that evolution follows the general lines sketched by St. Thomas in his doctrine on the evolution of the human embryo—the particular application of the doctrine we have abandoned, but it incontestably holds for the entire cosmic evolution.

We see no difficulty in the fact that intermediary forms are produced to disappear so soon after, because, not belonging to any complete species, they are simple transitions which lead to the determinate species; consequently they do not receive existence in order to keep it, but only in order that by them the being which is the ultimate end of generation be realized. One should not wonder at seeing that the same transformation does not continue during the time of the generation, but that there is a certain number of intermediate generations; for that is equally the case with alteration and growth, and Aristotle shows us that the only motion that is really continuous is local motion. Therefore the number of intermediate forms which gradually prepare for the ultimate form, and consequently the number of intermediary generations, is in proportion to the nobility of this form and of the distance that separates it from elementary form. That is why, when generation has for term animal and man, whose form is more perfect, there are many intermediate forms and generations and, consequently, corruptions, since the actual form is produced only by the destruction of the preceding one. Therefore the vegetative soul, which first gives the embryo the life of a plant, is destroyed after a period of time and gives place to a more perfect form, which is both nutritive and sensitive. The embryo lives then with animal life, and when the latter is in its turn destroyed, it is replaced by a rational soul which comes from without, although the two others have existed in virtue of an active principle inherent in the sperm.⁹³

We say only that in the case of man there exists a man before, a generating cause sufficient to dispose the matter. This cause is univocal, but cannot an equivocal cause realize the same effect? And is it natural to invoke it for the disposition of the body of the first man?

I say "the first man." But one might indeed object that, if the spiritual pressure is sufficient to raise natures to the disposition for the human body, and if this equivocal causality is even more perfect than univocal causes, the latter would have no reason for being. Why don't human beings show up everywhere without human generators?

Such reasoning is that of a delirious mind. We have recourse to equivocal causality only when a univocal cause is insufficient to explain the effect. Thus from the moment there exists a sufficient univocal cause, equivocal causality becomes, in this precise respect and in virtue of ontological economy, superfluous. In other words, *if all humanity could have its origin in a unique first individual, the contrary hypothesis is entirely gratuitous*. The constitution of this univocal cause is precisely the end of this impulse. Just as God manifests His power by creating effects which are causes in their turn, which spreading themselves out, thus imitating on another level, diffusive and creative goodness, so this equivocal causality attains its maximum when it succeeds in producing an effect which from then on is an independent cause.

It can be seen that creationism is a disguised revival of the ancient doctrine of those who rob natures of their proper actions, a doctrine vigorously opposed by St. Thomas, and which suppresses the divine governance by way of secondary causes.⁹⁴ God can make the works of nature better than nature herself. The activity of pure spirits is already infinitely more efficacious than that of natural beings. Should one conclude from that that it is worthier of these causes to remove from their effects all activity of their own?

If by the human body we understand a subject disposed *ultima dispositione*, we should then indeed say with St. Augustine and St. Thomas that this body was in the potency of matter from the very origin *secundum rationes causales*.⁹⁵ And by these *causal reasons* we understand the initial composite (matter and form) of the cosmos, its ultimate end (man), the efficient cause (the spiritual agent and the composite).⁹⁶ But it is understood that if one understands the human body in the strict sense, as that which is formally constituted by the spiritual form immediately created by God which responds to the ultimate necessitating disposition, *it is absolutely impossible that the body was produced by evolution*: since God alone can create

the human soul, He alone can make the human body. But if by "to make a human body" we mean all the preparatory and dispositive work preceding in time its formal constitution, one must indeed say that evolution fashioned it, and that it is in this very formation that evolution consists.

Although the formation of man's body preceded the creation of his soul, or reciprocally, it does not follow that the same man is prior to himself; for man does not consist only of his body or only of his soul. True, one of these parts has priority over the other, but there is no difficulty in that, for, in time matter is before form. Here we mean matter insofar as it is in potency to form and not as actually perfected. Therefore, from the point of view of time, the human body precedes the soul when it is in potency to it, that is, so long as it does not yet possess it; but then it does not actually have human nature, which belongs to it only potentially. When it has actually become something human, and that takes place at the moment when it receives its perfection from the human soul, it is neither before or after the soul, but the two exist simultaneously.

From the fact that the active principle in the sperm produces only the body and not the soul it does not follow that that operation of God and nature remain uncompleted, for it is the divine power that gives existence to the body and to the soul, although it forms the body by means of a natural agent, which is the power inherent in the sperm, and that it produces the soul immediately. Nor can one say that the action of the sperm's power is imperfectly exercised, since it makes its proper object perfect.

It is wrong to think that the soul exists for the body because the body is formed before the soul.

A being can exist for another in two ways: first, because its end is the activity or the preservation of that other, everything that is a natural consequence of existence, and in this sense the being which exists for another is posterior to it; such as clothing with respect to man and his tools to the worker; second, a thing exists for another when it exists that the other may exist, and in this case what exists for another has priority in time, but is posterior in the order of nature. It is in this second way that the body exists for the soul, as every matter does for its form. It would be otherwise if the body and soul did not unite in one common being, as say those who refuse to admit that the soul is the form of the body.⁹⁷

In other words, the whole travail of nature terminates in the rational soul immediately created by God, but *ad cuius causalitatem concurrunt caelum per motum suum materiam disponendo: with whose causality concurs that of the heaven and its motion disposing matter*.⁹⁸ Not that evolution produces the human body (no more than the parents the body of their child), and God the soul. The two causal lines meet in a being essentially one.⁹⁹ But in producing the ultimate necessitating disposition, the equivocal spiritual agent, or the parent, are causes of the union of soul and body, which enables us to say that man is *generated*.¹⁰⁰ What now was this animal whose elevation to the necessitating disposition by way of alteration calls *naturally* for the creation of the soul? It is for experimental science to tell us. And if man and the ape have, in this respect, a common ancestor, how would that detract from human dignity? Why prefer that he came from the mud? A preference somewhat lugubrious from an ontological point of view, a perverse manner of falling back into nonsense, for is it not a sin of angelism for man to deny his humble origins and to wish to have been given right off like a pure spirit? Is it not rather his glory to be the goal of these immense efforts of the world, prodigious and concentrated with an eye to his arrival?

11. Controversies over Evolution

Some scholastic philosophers and theologians seem to think that it is of the very essence of evolutionism to wish to pass over the Creator as much as possible, if not altogether. That is true of some evolutionists, but theories should not be judged by the abuses that can be made of them.

Let us say that there are two ways in which scholastics have sought to honor the Creator. The one consists in diminishing as much as possible the causality of the creature. That is the "idea in the back of the mind" of those authors who are called creationists. They want us to think that it takes a special creative act for the production of each natural and biological species as is the case with the angelic species and human forms. They deny the scientist the right to derive biological species the one from the other.

At the other extreme is found the Thomistic tendency, inspired by St. Augustine, which enriches as much as possible the causality of the creature, not with the goal of eliminating creative intervention, but in order to increase it:

for the creative power, envisaged from the side of its effect is most profoundly at work where created causes are most causes. The more a creature is capable of acting, the more it manifests the power of its ultimate cause, for God is the cause of all causality. From this point of view, He is much more profoundly cause of our free acts than we are ourselves. If we have a dread of the spirit which animates creationism this is because it is not creationist enough: in the final instance, it is a form of occasionalism.

With respect to those Thomists who have thought it necessary to adhere to creationism, their difficulty is based on a methodological error. As we said earlier, in Chapter One, one does not sufficiently distinguish the different points of view one adopts to study this problem. After these lengthy discussions we are in a position to give an example of the grounds of this essential difference between the method of the scientist and that of the philosopher.

Every science seeks to reduce the complex to the more simple and to explain the former as a function of the latter. But we must understand the meaning of the term "simple." The nature of the simplicity to which one must reduce everything differentiates profoundly wisdoms. But it is easy to show that what we call simple in experimental science is quite opposed to what we call simple in philosophy. In experimental science the atom is infinitely more simple than a cell, the motion of the piston is much more simple than the leap of a panther onto its prey, and of all the beings that experimental science studies man is incontestably the most complex. But in philosophy quite the opposite is true. The animal is more simple than the plant, and of all the beings which the philosophy of nature studies it is man that is the most simple; much as in metaphysics the measure and cause of all being is the absolute simplicity that is pure act. In physics one measures an object by the *minima mensura*—time by atomic time, for example—in philosophy the measure is always richer and more comprehensive—time is measured by aeviternity, and that by eternity, which is identified with its measure.

In other words, experimental simplicity is inversely proportional to ontological simplicity. The philosopher will say that the scientist explains the higher by the lower, the perfect by the imperfect. Thus we can say in advance that in the measure that an experimental explanation of man is possible, it will consist in studying him in the perspective of that which is experimentally more simple than him, not in order to identify the complex and the

elementary, but to derive the one from the other. It is therefore quite natural that the scientist seeks to derive man from animal, and animal from plant, and to see the whole hierarchy of natural species arranging itself in the direction of an organization always growing and more complex. The philosopher who denies the very possibility of an evolutionist theory denies the very essence of the scientific method. If he were logical, he would also deny the value of a measure of length. Let no one think he can escape this consequence by saying that the animal and plant are heterogeneous and rebel against a homogeneous measure. Can we not measure their duration with the same clock? Moreover, since existence is proportional to essence—*quantum unicuique inest de forma, tantum inest ei de virtute essendi*—the duration of cosmic beings is also more and more simple, less and less temporal; there exists thus a whole hierarchy of cosmic durations. But this ontological heterogeneity does not prevent physical time, which one defines by a description of its process of measurement, to link all spatio-temporal beings by what is homogeneous from the point of view of time. That common measure is grounded in the common genus of corporeity in which all natural beings are found. Physical time does not attain their depths (*bas-fond*) and touches them only from outside. Homogeneity being the basis of every quantitative measure, this common physical genus sufficiently explains the specific unity of experimental time, and why the heterogeneity of durations escapes the grasp of a metric calculated on homogenous exteriority. Experimental science takes its rise on the level where all natural beings touch and mingle. (The balance does not tell us if the object that registers 150 pounds is a rock or a human person. The graduated scale shows no difference between 150 pounds of bricks and 150 pounds of man.) If now physical time touched beings in their ontological and specific depth, if this time exhausted the real, if only from the point of view of duration, the different degrees of beings would be only epiphenomena of growing material complexity. But if these things are more than this “outside,” this does not prevent the measure of their homogeneous exteriority from being common and true. These two perspectives are not contrary, they complete one another. Without knowing the experimental complexity of a thing, one cannot grasp the richness of its ontological unity. It is time for us philosophers, who so often arrogate to ourselves the right to confuse everything and to judge everything without knowledge of the cause, to rid ourselves of a homogeneous conception of the degrees of wisdom.

The language in which we express the infusion of the spiritual soul—do we not say that it *comes* to disposed matter?—gives rise to images that can falsify the idea. Is it not strange that the term toward which the entire cosmos tends should come to matter, and that the latter should *receive* this form from without? As if the Creator applied a form to matter in the same way that a stamp is to a properly addressed envelope? It is important to note that God does not act *on* things, but from *within*. Proceeding immediately from the Creator, the emanation of the spiritual soul is by that very fact more intimate, it comes more from within than the forms extracted from the potency of matter and which mark out the road to an emanation so profound that it must come immediately from the Universal Cause. In this perspective, it is rather material forms that come to and are from without.

12. The Cosmos as Impulse toward the Life of Thought

It is in man's intelligence that nature accomplishes its first definitive trajectory. We have seen in effect that the creature cannot realize his explicit return to God, his principle, except by thought. If God creates, necessarily He creates in order to manifest His glory outside, not to manifest it to Himself, as if by creation He could grow in His own regard. Creation is essentially a communication. His work must be capable of appreciating the gratuitous gift that communication is and that is achieved in the *person*, that is, in an intellectual creature who can give glory to his Principle. That is why God could not create a cosmos which was not essentially ordered to an intracosmic intelligence.¹⁰¹ We have also seen in what sense matter is entirely at the service of spirit: either as nature and tendency toward man, or as subject of the proportioned spiritual form of human thought, a thought so attenuated that it cannot confront immaterial things.

Having studied the ontological mechanism of evolution, let us now consider this same process in the formal perspective of cosmic thought.

It is only in human understanding that the cosmos becomes a universe in the full sense. St. Thomas says,

A thing can be perfect in two ways. In one way a thing is called perfect according to the perfection of his being, which perfection belongs to

him according to his proper species. But because the specific being of a thing is distinct from the specific being of another thing, for this reason and in this precise respect, a created thing is purely and simply imperfect to the degree that it does not share in the perfection realized in other species; in this perspective the perfection of every created thing is imperfect, being only a part of the perfection of the whole universe, a perfection which flows from the coordination of particular things. But in order to compensate for this defect, there is found in some created things another kind of perfection; that by which the perfection which is proper to one thing can exist in another, and this is the perfection of the knower as knower, for we say of an object that it is known when it exists in a certain fashion in the knower. That is why it is said that the soul is in a way everything. And in this fashion the perfection of the entire universe can exist in one of its parts. For this reason philosophers have held that the ultimate perfection to which the soul can attain consists in embracing the whole order of the universe and its causes.¹⁰²

All the parts are evidently coordinated with an eye to the perfection of the whole; for the whole is not for the parts, but the parts for the whole. But intelligent natures have more affinity than the others with the whole, for each intelligent substance is in a certain way all things, in the sense that it can comprehend with its intelligence the whole of being, whereas the other substances participate in being only partly. Therefore it is in the order that God provides other beings because of intelligent substances.¹⁰³

In order for the world to have a *raison d'être*, in order for it to be profoundly one and a universe, it is not enough that it be composed of parts and that these parts physically constitute a whole; it is also necessary that all the individual parts be oriented toward that one in which all together can exist, that each of the principal parts of the universe should be the entire whole, that each of these universes be in some fashion all the others.

In what sense can it be said that the soul is all things? Ought one not rather say that we have intelligence only to observe how obscure and impenetrable things are? We are so ignorant that it is impossible for us to know how ignorant we are. For the rest, if we knew the depth of our ignorance, we would be truly omniscient, for we would have to know what we do not know.

That is why God alone knows how much we do not know, for He alone knows everything.

Yet, to know that one does not know the whole of anything is a way of knowing the whole. When I say that I know nothing, I say that I am ignorant of everything. But how could I know that I do not know the whole, if I did not in some way know all things? I know that over and above the knowable whole there is nothing to know. There is then a way of not knowing the whole while knowing the whole. It is in this that the privilege of intelligence consists: it can say "nothing," "non-being," "impossible," which would be impossible if it did not in some way make a tour of being, if being were not transcendently accessible to intelligence. Although this knowledge of being is infinitely indeterminate, confused, and implicit, it is nonetheless knowledge of all things as being. The progress of intelligence will consist in a growing explicitation of the confused and implicit content of being. But it suffices to have shown here in what sense every thought is necessarily open to all things, and unlimited, and in what sense it is made to live the whole universe.

We can then consider the maturation of the cosmos as a tendency toward the thought in which all its parts are united and lived; the cosmos thus tends to compenetrates itself, to touch itself in the intelligence of man, in which it can realize this explicit return to its First Principle.

Let us imagine the initial state of our universe as a pure exteriority. The world was so to say entirely outside, separated from itself, imprisoned in itself and its own obscurity. It is dead, empty, an abyss of division. But intelligence must appear. This demand is written in it from the beginning. Intelligence being a species of compenetration, it is necessary that the universe fall back in a certain way on itself, and that it close in on itself, that it interiorize, and it is just this interiorization that will permit it to open onto itself.

In the theory of the expansion of the universe, physics reveals to us a world which, beginning from an immense primitive atom, in which is found compacted all the energy now dispersed, an explosion occurs. We are in a universe which stretches itself and whose fragments are more and more dispersed. In the law of the degradation of energy, this same physics shows us an aging universe: energy, even while being quantitatively the same, is more and more irreversibly degraded. The world tends toward complete exhaustion, toward thermodynamic equilibrium.

In the theory of mutations, biology too sees life advance by successive explosions. But instead of the impoverishing dispersion of the physical world, life blossoms out by *dehiscence*; it always gets richer. The flower is a progress over its bud. The chick that breaks the shell of the egg by pushing from within provides us with a synthetic image of the manner in which life surges up in the cosmos. The physical world is like the shell of the egg.

Regarding these two inverse phenomena from the point of view of philosophy of science, we can say that it is the thrust of life which dismantles the universe under its physical aspect, which uses this universe and makes space grow. What is concentration from the physical point of view is separation from the biological point of view. When life travels toward an organization always more intense, the disorganization of the physical world is only a loss of a cosmos which is absorbed in life.

By this contraction the biosphere lifts itself above the fragmentation of space, the disappearance of time, which are only ashes and smoke of a world which glows with life. Absolutely speaking, it is life which, in the effort to touch itself in a consciousness, in a center of pure density, cuts through space-time as the prow of a ship cuts through the water.

Life travels against the grain of the diffusion of time: it is a species of triumph over the scattering of physical time. Thus, as we have already said, it is in the consciousness of animals and men that we find the most manifest sign of it, and most especially in memory. To the degree that a being is living, it is lifted above the conditions of space and of time which are separation. A knowing being is present to himself and intentionally assimilates his surroundings, whereas where space dominates, things are separated from one another and plunged into night.

The universe in expansion from the physical point of view rebounds on itself in life, constituting in these contractions more and more dense centers, more and more heterogeneous nuclei. It arrives finally at man in whom the world succeeds in uniting all the degrees of cosmic being, and in thought in which it touches and compenetrates itself. The world tends to join in man its extremities separated by space-time. In doing this, nature projects that whole hierarchy of species which the paleontologist and biologist study.

We said that the biosphere is lifted more and more above time. And this is not only a metaphor. Beings are perfected to the degree that they are intemporal; transcendence over the diffusion of time is a condition of life, of knowl-

edge, of thought. If the vegetative species are hierarchized according as they approach animal species, and the latter in their turn as they approach man, it must be said that the vital thrust with which the cosmos is animated from outside since its origin, elicited from the potency of the matter of composites whose forms emerge more and more from matter; that is, essences more and more simple and one. *Quanto forma magis vincit materiam, tanto ex ea et materia magis efficitur unum*. But, since essence is proportional to existence, the duration of cosmic beings is also more and more simple, and less and less temporal. As has been said, they are specifically hierarchized in their existence as well as in their essence. The animal is less temporal than the plant.

This ontological perspective no doubt seems strange, since, from the experimental point of view, we use the same clock to measure the duration of all the specifically different beings. But, as we have seen in the preceding paragraph, these two perspectives are profoundly different.

It is understood that the diverse durations of natural beings are all temporal in the ontological sense, that is, successive and continuous. But some are less so than others. And when we consider this hierarchy of durations in the direction of their lower limit where they become experimentally measurable, we observe that these diverse durations incline to confuse themselves and evanesce in physical time to the point of erasing every distinction among *beings*. If the principle of the conservation of energy is true, and if the mass of the universe is constant, physical time is in this perspective absolutely one; in this perspective, which abstracts from the ontological cuts that divide the world into individuals, the diverse physical times proper to beings—the life of a cat, for example—are only local condensations of the same time which goes back to the origin. But if we consider ontologically, these same local condensations afflicted thanks to a transformation of energy are centers which gnaw at the physical world and consume it. And it is then the maturation of the biosphere, entailing in the physical line a degradation of energy, which gives birth to physical time and makes it enlarge; life, by dispersing the physical world whose disintegration is only the reverse of progressive biological organization, makes time. And here is a singular paradox. It is life itself that makes the time from which it distances itself. The fact of covering a distance suppresses it for the one who covers it. The inorganic world being the *terminus a quo* (A) of life in evolution (V), and the spiritual its *terminus ad quem* (B), the distance AV increases to the degree that the distance BV lessens.

Is not the inorganic world the most ancient, the most durable? Is it not absurd to say that the duration of living things is richer than that of the imperishable non-living?

It is here that the necessity of distinguishing the ontological and physical aspects of duration is clear. The quantity of time is a sign of a relaxed existence. While being quantitatively longer, the duration of the inorganic world is ontologically poorer. Considered in itself, it takes time to exist, *et peu s'y fait*—it *loses* time. This duration is diffused because it has little consistency. Homogeneous diffusion is a condition of quantitative measurability. A living being that existed only an instant would have an infinitely richer duration than that of the stars, although it would be infinitely shorter; it is infinitely closer to eternity than the aging inorganic world. It is again the notion of physical time, first in the experimental order, that makes us think quantity is a property essential to duration. And yet, the most simple duration does not mean the least duration.

In the order of homogenized, diffuse, and quantitatively measured, where the imperfect precedes the perfect, the ontologically more simple durations come after the more diffuse. In this perspective of progression in time, the world tends to reduce the quantitative measurability of beings, not by shortening this duration, but by intensifying it. This concentration can only be had at the expense of quantity. Death is necessarily a function of life. It is the uplift of life that is the cause of death.

We said earlier that the tendency of the world has as terminal point something immobile that does not have to pursue its existence, and if existence is successive insofar as it is composed of matter and form, this being is nonetheless above time because of the spirituality of its incorruptible form. If evolution could be completed in one leap, it would also realize at once an immortal cosmic being whose duration would be both quantitatively indefinite and ontologically simple. Subject to the resistance of matter, the world rejoins this end by projecting a whole hierarchy of intermediate composites in which it has not succeeded in establishing that equivalence of quantity and intensity of duration. Natural subhuman species should be considered as more and more audacious attempts to detach the world itself from the dispersion of time, in order to dominate it from outside, instead of being borne away by it. This ascent is made by sacrificing time from the point of view of quantity, as a man sacrifices his life in an heroic deed that makes him

worthy of immortality. Evolution is a struggle against death, by means of death if necessary.

Our entire universe is troubled by a pitiless desire for immortality, a cosmic desire which takes on terrible proportions. The terrible thing essential to evolution is death.¹⁰⁴ Here below, generation always involves corruption. Elementary living things which multiply by dividing die in this generation. The unicellular living thing does not divide into two parts: it gives birth to two new individuals, and their birth is its death. The very fight to preserve life already involves death.

The maintenance of life is accomplished thanks to death. It is necessary for the animal to be nourished by organic substances. The biosphere eats itself in order to grow; it must destroy itself to the degree that it enriches itself. Tragedy is essential to cosmic life. The desire to reach man (and in humanity the desire to attain always higher cultural levels) knows no pity. To the degree that life becomes more noble and more intense in organization, death becomes more terrible and the fear of death takes on the most frightening proportions. We will come back to this point in the next section.

The expansion of space and the scattering of energy are in their turn only the reverse of a contraction in the ontological order. In the drive to produce more and more heterogeneous beings, nature is forced to overcome the homogeneity of space. The differentiation of parts which becomes more and more pronounced in living things is but an external sign of this.

In assimilating the other in sensible knowledge, the animal already breaks the barriers of a separating space; he extends himself to what is not himself: he can live the other. To the degree that animals are more perfect, the field of their knowledge becomes more vast; that is to say, the world compenetrates itself more and becomes more and more present to itself, more and more interior. This growing introversion blossoms into ontological simplicity in the human soul where intelligence embraces space without being mixed up in it, and transcends it. Not that the regard of this intelligence penetrates space and envelops it in the way that a pure spirit contemplates the world outside. Accidentally at least, the human spirit is tied to a corner of space like a tree, with this very profound difference that the corner can move itself. The immobility of human thought is thus intermediary between that of a pure spirit and that of a tree, conjoined in man thanks to local motion. That is the profound sense of the locomobility of knowers, a power

that frees them from the shackles of their spatiality, and which in the final instance is at the service of the exploring intelligence. The intelligence, immobile in itself and transcending every place, must yet travel the world in order to assimilate it. The locomotion of living things is a species of the tendency toward ubiquity, toward a certain intentional omnipresence and a sort of immensity.

Although from the point of view of physics local motion from a material point is dispersion and total abandonment of the preceding position, by its displacement the conscious center gathers and enriches, living the preceding positions all together in the place where it finds itself for an instant. Man is a "microcosm," not only because in the ontological line he contains in himself all the degrees of being in nature, but above all because in the intentional line he is potentially all things. He uses the resources of art to draw to himself all the richness of the world diffused in space and time. The progress of navigation and aviation, the perfecting of telescopes, and the means of long distance communication supplied by modern technology are conquests for intelligence. The ultimate end of these emancipations is not control or the shipping of beans and bananas, nor weather prediction; it is more profoundly the exploration of the world with an eye to gathering it to a point, and contemplation.¹⁰⁵ Evolution is the world's effort to communicate with itself and thus to imitate its First Principle—the *Thought of Thought*. In the idea we make for ourselves of evolution, infrahuman beings are essentially in function of man, and fleeting: these natures thus are open to one another, constituting in their ascension toward him a more and more determined and powerful drive. But one should not conclude from this that this function is reduced to a pure canalization of the spiritual energy with which the cosmos is impregnated. This is too simplistic an interpretation. Necessarily a work of nature and a gift of self, so that evolution will be a gift of self *in the precise degree that it is a work of nature*, without which the concept of nature would become an exclusively passive principle.

It is true that inorganic nature, considered in itself, is only a passive principle of motion, and that such nature cannot actively give itself. But this creationist way of isolating inorganic nature is denaturing and factitious. Nature is only nature. Even inorganic nature is form and matter, although its form is not soul, that is, a principle of self-motion. But it is precisely this essential lack that opens the inorganic world to the spiritual universe, with-

out the influx of which the inorganic would be deprived of its natural end, and thus contradictory. This essential need appeals to the spiritual world for the constitution of active nature; this need is logically anterior to the activity of nature.

And yet, taking into account the motive for this need—a motive inscribed in the inorganic by its ordination to life, which is its *raison d'être*—already the non-living begs to be given it: it gives out of its desire to be given by its natural appetite. And in this way is accomplished the generosity nature is. The non-living moves only insofar as it is moved, but it touches life at its two extremities like the paintbrush through which is filtered the thought of the artist.

While in the original eruption of life out of the inorganic the latter accomplishes the gift of self under the motion of a transcosmic agent; the plant, on the contrary, is already a certain self that affirms itself, which assimilates the non-living, which communicates its own life in the generation of similars, restoring thus to the world more than it received. Here already there is a gift of self by the self, that is, life.

When we consider the plant in the perspective of the ultimate end to be attained—a pure interiority—it seems a shallow vase; its feeble capacity makes it too swiftly overflow it; the fruit of its maturing detaches from it; deprived of all consciousness, it cannot communicate its own life, it lives in the night; it is completely exhausted by generation. *Non enim est in plantis aliquod nobilius opus vitae quam generatio.*

Let us listen to St. Thomas:

The mode of emanation of beings varies following the diversity of their natures; and the more elevated the nature, the more what emanates from it is more intimate. . . . After inanimate bodies, plants come immediately, and in them emanation already proceeds from the interior insofar as the sap, which is in the plant, is changed to seed, and the seed given to earth produces a plant. That is the first degree of life, for living beings are those which can move themselves to act and those which on the contrary can move only by something extrinsic, are absolutely deprived of life; what reveals life in plants is that a principle inherent to them determines a certain kind of motor action. Still, the life of plants is imperfect because, although with them emanation proceeds from an

intrinsic principle, however, which emanates from them, gradually leaving the interior ends by being completely extrinsic: for example, the sap in leaving the tree becomes first a flower, and then fruit which is distinct from the bark while remaining attached to it; when the fruit is fully developed, it is completely separated from the tree, and, falling to earth, produces another plant by the power inherent in the seed. Reflection enables one to see that even the first principle of this emanation is drawn with without, for the tree draws from the earth, through its roots, this intrinsic sap with which the plant is nourished.¹⁰⁶

Let us note as well that the plant can assimilate the outside only by disintegrating it: nutrition entails corruption of the object assimilated; the plant cannot become the other objectively, that is, as other.

Above the life of plants we find a more elevated kind of life, that of the sensitive soul, whose proper emanation, although its principle is extrinsic, nonetheless terminates in the interior; and the more one advances in emanation the more intimate it becomes, for the external sensible impresses its form on the external senses, when it passed to the imagination, and finally into the treasure house of memory. Moreover, at each step in this emanation, the principle and the term belong to different powers, for no sense power reflects on itself. This degree of life is thus so much superior to the life of plants that the proper operation of this kind of life is circumscribed in the intimacy of the being. Yet, is not an absolutely perfect life, since the emanation passes from one power to another.¹⁰⁷

The animal has consciousness, but he does not know that he knows. He cannot express himself to himself, he does not compenetrates in the consciousness of self. "The highest degree of life is therefore the life of intelligence, because intelligence reflects on itself and can know itself. But . . . although human intelligence can know itself, it takes from outside that which constitutes the first principle of its knowledge, since it is incapable of knowing without images."¹⁰⁸

Although our intelligence only knows itself in the grasp of an object other than self, it is nonetheless consciousness in the full sense of the word, since it is truly present to itself and touches itself. Man can say "I think," and to God, "I adore You."

In human intelligence the cosmos not only becomes present to itself, this presence opens on the whole of being and thus it can realize an explicitly lived return to the First Principle of being—God, who draws the world from Himself in order to 'speak' Himself by it, and which thus opens an abyss where He can make His abode.

13. Cosmic Desire as Thrust toward the Consubstantial Love and Liberty

Every thing is love, either insofar as it is ordered to an end, or insofar as it travels toward that end, or insofar as it rests in it. Whether it be distinct from the loving subject or identified with him, every being is good insofar as it is an object of love—*bonum est quod omnia appetunt*.

The good is essentially an end, and while it is first in intention, it is the last in execution. With respect to execution or realization, the first thing is clearly what is produced above all in the being which tends to the end. But equally clearly every being which tends to an end must have an aptitude or proportion with respect to that end, for it is impossible that a being tend toward an end which is entirely disproportional to it. Second, comes the movement toward the end. Then, it is repose in the acquired end. But this aptitude, this proportion of appetite with respect to the end, is love, which is nothing other than delight in the good; the movement toward this good is desire or concupiscence; repose in the good acquired is joy or delight. And following this order, love precedes desire and desire precedes delight. But if we consider the order of intention, it is the contrary that emerges: the delight willed is the cause of desire and love; in effect, delight is rejoicing in the good, which is an end of sorts, like the good itself.¹⁰⁹

Consequently, if we consider love as the aptitude or proportion of a thing to some other thing—as potency is aptitude to act—there is love in the inanimate and vegetative as well as in the knowing.

Love pertains to appetite, because the one and the other have good for its object; the modes of appetite ought then serve us as a model for distinguishing love. There is an appetite which does not follow on the

knowledge of the desirer but on that of someone else, and this is natural appetite in inanimate things, for they do not seek what befits them because of their own knowledge but rather the knowledge of the Orderer of nature. Next there is an appetite which follows apprehension, but necessarily, without free will: this is the sensible affectivity of the brute, although this appetite is also found in man along with some freedom, since it is subject to reason. Finally, there is an appetite that follows on apprehension with free will: this is rational or intellectual appetite which is called the will. In each of the appetites, love is the principle of movement toward the end sought. In natural appetite, the principle of this tendency is the connaturality of the subject to that to which it tends, what we can call natural love. . . . Similarly the coaptation between sensible affectivity or will is such or such a good, that is the complaisance with the good is called sensitive, intellective or reasonable love.¹¹⁰

In knowledge we become the thing known in an intentional way, we remain separated from its concrete being, we cannot be the very being in itself of the thing known. The latter is not itself in the faculty of knowledge but only according to resemblance. But we have seen that love is grounded on a certain conformity which carries the loving subject toward the loved object; by the intentional presence of the known object in the knower there is constituted a particular conformity which will bear the knowing subject toward the known object as it exists in itself, toward its concrete being. This conformity is the beginning, not the end. It is an end for knowledge but a principle of appetite. So much so that the knowledge by which the subject draws the universe to himself not only enlarges the subject in himself, this knowledge also opens on the concrete being of the other as on a good in which it could participate in a physical manner. While in knowledge the subject has only a resemblance of the other, by the inclination that follows apprehension of the other, he communicates with the other in the other.¹¹¹ Because of that the creature tends as much as he can to imitate the supreme Being in whom understanding and love are identical with one another and with their object.

Just as the faculty of knowing is not coextensive with either being or life—since one can be and live without knowing—so, too, love and knowledge are not as such coextensive. There is love in the plant but not knowledge. Even in animals knowledge remains subjugated by affectivity, since

they cannot know for the sake of knowing, in which most of us seem to resemble them. On the contrary, in man taken purely as such, there is coextension between the object of intelligence and the object of love, since intellect grasps the mark (*ratio*) of the good. Indeed, the domain of intellect extends beyond the domain of love, for we can think of objects to which the will cannot tend as proper objects—mathematical entities, for example.¹¹² (If will were coextensive with intelligence, everything known would be willed, such that one could not know without loving, and thus God could not know the creature without loving it; and as His knowledge of every possible creature is necessary, He would also have necessarily to create it.) In intellectual being, the inclination which follows on apprehension is under the command of intelligence.

Let us note the paradoxical character of these ideas: on the one hand, the cognitive power is not coextensive with being, in the sense that not every being is knowing; on the other hand, only knowledge extends to all things. A thing is not possible, nor does it exist, without being known; if it cannot know, knowledge is still a condition of its being. (That is why that which is most profound in being is thought, and the life of thought is the formal constitutive of the divine nature.) There cannot be love without knowledge. The end toward which the non-knower is oriented and toward which it tends is neither really nor intentionally present to it. And yet, the end must be present to the subject that pursues it in order that the relation which is natural appetite be grounded. But this presence with respect to appetite can only be intentional. Therefore, it presupposes knowledge of the end in another subject.

In perfectible things, the imperfect precedes the perfect in time. Just as inanimate being precedes the living here below, so love precedes knowledge in the evolution of nature. Natural being will be more perfect insofar as its love proceeds rather from its own knowledge. The appetite that follows on intelligence which grasps the quiddity of being will carry toward being as toward its proper good. Just as intelligence is itself included in being and can reflect on itself, so the will, included in the idea of universal good and presented to it by intelligence, can love itself.

As God created in order to communicate, He is necessarily the Ultimate end of all things. Not having the character of good and desirable except as they participate in a divine likeness, every created being, in desiring any

good whatever, be it an intelligent, sensitive, or natural desire, desires God as its end. But just as only intellectual creatures are capable of knowing God in an explicit manner, so, too, they alone are capable of loving Him in an explicit manner. All infrahuman things thus tend toward God by their tendency toward the human species to which they are immediately ordered and in which the trajectory of their desire is accomplished. They are love of and desire for man by their very tendency toward the explicit love of God.¹¹³ Their desire, like their being, remains functional; the term cannot exist in the individual subject from which the desire emanates. What characterizes the love of irrational creatures is the incapacity to be loved in a radical fashion that presupposes the grasp of the universal idea of the good. As individual subjects, they cannot participate in the term of their desire. Seeking its individual good, the plant is exteriorized in generation: it is incapable of containing the fruit of its maturation. We are confronted here with a species of inverted altruism. As an individual it cannot love the good of another; as part ordered to the good of the whole, the pursuit of its proper good devolves on the other. It is in this sense that it is given to the other and that it is functional. Only the rational creature is able to give himself, in the measure that he is capable of possessing himself. The love of irrational creatures is substantial, but it cannot be consubstantial; lacking consciousness, they cannot be *with* themselves. Possession of oneself is a condition of the gift of self. And that is why God alone can give Himself in a full sense, for He alone possesses Himself in an absolute manner. His communication of self is even so profound that it is terminated in beings capable of imitating Him and giving themselves in their turn; although God is the absolute cause of the gift of self in all intellectual creatures.

Just as the cosmos seeks to compenetrates itself more through knowledge, so it tends to be united to itself and possess itself effectively in love. At the beginning it was so to speak entirely turned outside and separated from itself. But in the measure that it returns to itself in knowledge, it returns to itself in love. At the origin there was only natural appetite in the world, without knowledge in the subject and without intelligence. And yet the intrinsic ultimate end of the world is already inscribed in it as the term of its natural tendency. The goodness of man is so great that it extends itself to the very first instant of the existence of this universe that it draws to itself.¹¹⁴ Every appetite presupposes in effect a certain conformity of the lover to the loved,

either a conformity in act or a conformity by reason of potency as proportioned to the act to which it is essentially ordered—*secundum quod potentia habet similitudinem ad actum ipsum, nam ipsa potentia quodammodo est actus*. It is thus that matter is, in all its essence, a love of the human soul in which love becomes consubstantial. And it is just toward consubstantial love that the whole universe tends, that is, toward the love of self for itself, not doubtless as ultimate end, but as the pre-condition of the explicit return to the First Principle by love.

In the measure that the world approaches its term, its desire proceeds more and more actively from within, it becomes more and more elicited and a fruit of knowledge. In knowers, there is not only natural appetite, but also elicited appetite, that is, following on knowledge. And in the measure that this elicited appetite deepens, it approaches the human will.

There is cosmic love and desire, there is also a cosmic will which precedes that of man, and which is the active principle of the ascent of the world to its goal. Infrahuman living things are love for the higher forms of life, but this love cannot become desire without the cooperation of a sufficient cause, that is, of a cause at the level of the perfection of the goal pursued, and which in the final instance is nothing other than the spiritual agent (or agents) of which we have already spoken. The will by which this agent works the world and cooperates with nature in its ascent can be called *cosmic will* in the measure that it responds to the natural love in the world to become desire and conduct itself to its term. The ascent of life is thus a voluntary movement: *est voluntarius, quantum ad principium activum, et naturalis, quantum ad principium passivum*.¹¹⁵ It is natural because of the passive principle, natural love, which tends to be released. Moreover, the principal goal of this motion is not to make use of the passivity of nature, but to increase love in it so that the desire might spring from a more and more profound interiority, proceed more and more from the within of nature by means of knowledge, and that love increase with consciousness, and in it, to arrive finally at a love reflected on itself, that the passion of living become more and more tense, the instinct of preservation more and more ferocious, and death more terrible. *Timor ex amore nascitur*.¹¹⁶

As knowledge increases in the world, elicited appetite extends to more things: the field of its good becomes more vast. But sensible knowledge remains necessarily on the surface of things, since it cannot grasp universal

being nor reflect on itself; it follows that animals cannot grasp the very nature of the good, but this or that particular. Man, on the contrary, inclines to the good with the knowledge proper to intelligence which grasps the very nature of the good, which is identified with universal being; he inclines to the good, not under the impulsion of an alien cause, as is the case with beings deprived of knowledge, nor simply to the particular good, as is the case with beings having only sense knowledge, but to the universal: this elicited inclination is the will.¹¹⁷ The cosmos thus touches will at its two extremities: the cosmic will which tends to rejoin the human will.

By the very fact that the cosmos tends toward intelligence and will, it also tends toward freedom. We find indeed a more and more profound vestige of freedom in the spontaneity of plants and animals, a spontaneity by which they participate extrinsically in freedom. If living beings were not endowed with spontaneity, things would go on as if the principle of their activity were entirely external and it would be impossible to distinguish them from the inanimate; the living being would be like a machine.

There is here a singular paradox. We said above that evolution consists in lifting up ever more determinate natures. But spontaneity and freedom are essentially indeterminations. Is there not a contradiction? There are, however, two basically different types of indeterminations. The indeterminations of matter are indeterminations by defect of being; spontaneity, on the contrary, is indeterminations by surplus, by superabundance; it is a consequence of determination. The more perfect the intellectual being, the more free; the more natures are determined, the more spontaneous are the activities that spring from them.

Nothing equals the seriousness and pragmatism of the lower animals who do nothing useless. Higher animals, on the contrary, play. They have energy to dispense gratuitously. And if it is not perfectly disinterested, their play at least tends toward an activity exercised for themselves. Nothing prevents us from imagining that it is in play, which requires a quick adaptation to new situations and sharp attention, that the higher animals have been progressively disposed and have called intelligence into the world. For the proper life of intelligence is above all play, a game within the principles of being and thought.

It is by the formation of hands that nature was freed little by little from the shackles of a determination due to defect of interiority; life directed by

instinct tends toward one directed by reason. St. Thomas says, "The intellectual soul is in potency to an infinity of acts from the fact that it can grasp universal essences. It is not possible that instinctive judgments of a certain kind would be fixed for him, or even special means of defense and protection, as is the case with animals whose knowledge and activity are determined to certain particular ends. In place of all that, man by nature has reason and the hand, which is the *organ of organs*, because it enables him to fabricate tools of infinite variety and for an infinity of uses."¹¹⁸

Human nature is so rich that it needs nothing more. Man must create the means that he does not possess by nature. Art responds to a natural need and, in this precise respect, one can say that nature tends toward art, toward the *ars cooperativa naturae*. Let us take an example, in appearance extremely banal, the culinary art which in its deepest purpose is not for the preservation of health but responds to the refined taste of a sense at the service of intelligence. The most intelligent people, the most civilized, have the best cuisine.

Man has need of art not only to respond to the natural demands of a higher animal, but also for the operations of spirit, for the very life of speculative thought which depends on art. Logic is necessary for it. Mathematics is both a science and an art. And without art there would be no experimental science, for the procedures of measurement and mathematical construction of a theory from which derive the relations between number-measures are operations of art. Every language in which we express ourselves is a work of art.

This shows how false is the opinion of those who want what they call a return to pure nature. That would mean that man should fall back into the condition of the brute. It is quite paradoxical that naturists who pretend to live according to nature by the denial of all art are precisely those who deny nature since it is of the essence of very superior and very pure nature to prolong and fortify itself by art.

Although it could be explained as a reaction against the abuse of art—and let us admit that our times are victim of an art which has been pushed beyond its limits, which gets lost in the indefinite, and, in place of cooperating with nature, destroys it—there is nothing more anti-natural than naturism whether it is called anti-machinism, vegetarianism, the medicine of simples, nudism, or prohibition. All that is fundamentally perverse, in the measure that one considers the specific intervention of man in nature as an evil. It is a profoundly degenerate conception of man as well as of nature.

Naturism recoils from the effort required to impose the determination of reason in the constructs of art, just as it recoils from the measure that temperance in morality presupposes, where measure and determination are demanded by nature.

The moral order also is for us a condition of freedom. For those who do not confuse the indetermination of free will with the indetermination of prime matter, freedom is, in effect, the fruit of determination. Moral laws are not obstacles to freedom, they do not impose limits on it; they are essentially at the service of free agents. The possibility of choosing between good and evil is the case with an inferior will, of a will which is not master of its indetermination and which can succumb to the indetermination that is a defect of being. The virtues are determinations which free us from the shackles of that indetermination and by that very fact open for us the way to truly free action, which enables us to act with ease and promptness. It is the virtuous man who is free, not the man who does everything he likes. The just man is above the law in that he acts according to the law in a spontaneous manner without extrinsic constraint; it is the unjust who is under the law and deprived of true freedom.

It is remarkable that the useful arts, having attained a certain degree of perfection, tend more and more toward beauty. Let us not hesitate to consider a very ordinary case. An automobile is essentially a useful thing. But the more it is perfected mechanically and is adapted more to the demands of speed, endurance, comfort, it also becomes more beautiful. Let us say that a certain beauty was always aimed at, one that could only be realized by technical perfection that was not in the first instance meant to embellish it. At the beginning, a show was made of the mechanism. Today the entrails of cars are more and more hidden, and even if one did it exclusively to protect the mechanism, one would also have attained more aesthetic results in dissimulating all that is materially complicated and laborious. The artist imitates nature in doing this. At the beginning, life made a show of organs which in higher beings she has hidden. To the degree that immaterial interiority, physical and physiological, increase, the more hidden is the complexity and organization. Note moreover that that which is most fundamental in man envisaged from the point of view of experimental science is not found on the level of consciousness. We are not conscious of our atoms, our cells, our digestion. That which constitutes the dignity of a lower being becomes secondary and functional in higher beings. *Toute proportion gardée*, knowledge is

superior to natural generation which remains a vegetative function. In man, sense knowledge is in function of intelligence. A work of sculpture is not a simple assembling of the members and organs of sensation, but above all the expression of the spirit of which they are the function, and the artist who would express man does well to bring them to the fore. In man considered in a state of ideal equilibrium it is not body which hides intelligence, but the opposite. Like nature, the artist tends to conceal what is purely useful in order to put it in its place, not to suppress or empty his work of the utility which is a precondition of its beauty. The chair must first of all be a chair and not an instrument of torture or an invitation to adventure. The beauty of the work in useful arts is a beauty by surplus which increases with the perfection proper to the work.

But the highest expression of human art is that found in the fine arts which are essentially pure and disinterested. They are not only the work of intelligence but also of the will which exteriorizes the work conceived, thus giving it its own being. The artist is truly the imitator of God the creator and of nature.

Natural things are in fact works of the divine art. Like creation, the fine arts are disinterested, and please the artist as if as a bonus. They derive all their value from their lack of utility, they are objects of contemplation and of the love of contemplation and they also have their own being. And just as a nature is perfect in the measure that it is an intrinsic principle of movement, so a work of art is perfect in the measure that it has a proper life, that it speaks for itself, and is independent and subsists in itself. The works of the divine art are perfect to the point of being natures. *Res naturales sunt quodammodo artificiata Dei*. Although human art cannot produce natures, it tends to give to its works an interiority like that of natures. Art imitates nature in the production as well as in the work. *Ars imitatur naturam*—an imitation which does not consist of making copies of nature, but of proceeding, on a properly human plane, as nature does, to produce works which, like those of nature, have their own interiority. The copy is false and hideous because it remains on the surface and is empty of all interiority, like a mannequin. What there is of a copy in a work of art is simply a point of departure, necessary but extrinsic, for a life which is lived within.

The fact that art is inferior to contemplation should not make us lose sight of its proper grandeur. Just as creation proceeds from the divine art, so the created work responds to the creator in imitating the proper activity

which produced the creature. Just as creation is a free manifestation of the divine superabundance, so created art, considered at its summit—the praise that we formulate and that we address to God—is a work of art which springs from the superabundance of contemplation.

14. The Unity of the Cosmos

“The good of the universe is twofold: one is a separated good, namely God, who is like the head of an army; the other is in created things themselves, and this good is constituted by the order of the parts of the universe.”¹¹⁹ The proper perfection of the ensemble of the universe consists in the unity of the coordination of its parts.

Tending toward a greater perfection, the cosmos, whose ensemble in its turn is only a part of the universe,¹²⁰ also tends toward a greater unity. But we are tempted to think that the origin of the cosmos was constituted by a unique substance, or at the least by a very restricted number of substances, and that the multiple is simply of the accidental order. The multitude of substances and their diversity are the fruit of the work of propagation and maturing of the world. How to reconcile these apparently contradictory ideas? We must distinguish between the unity of perfection and the unity that is a defect of being. God is one by his own pure actuality, by his absolute determination; prime matter is one by its negative indetermination, by its pure potentiality: it is a unity which because of its imperfection cannot be differentiated and multiplied: it is one by negation. Consequently the multiplicity of substances that can be extracted from the matter of an original substance is a progress from the point of view of positive unity. And we thus see under what aspect the world can be more one, while being multiple, and in what sense the multiple can be a condition and consequence of unity. *Multitudo est quoddam unum*. The multiple is interior to the being whose unity is a transcendental property and so there is an analogy between the unity of creation and the unity of God. If unity were a univocal property of being, creatures would have to be less and less numerous as they approach the perfection of God. That was indeed the view of some Platonists who, ignoring or rejecting the distinction between *one* the transcendental property of being and *one* the principle of number, were then constrained to say that the multiple is

purely and simply repugnant to unity, and that God could not be its cause. Applying this idea to the angels, they thought that they were less numerous as one ascended the hierarchy. And that came from their thinking that the more things approached the first principle, their number diminished, as numbers diminish as they approach one. Saint Thomas holds on the contrary that the more perfect things are in themselves, the more they have been created in great numbers. “*Quanto aliqua sunt magis perfecta, tanto in majori excessu sunt creata a Deo.*”¹²¹

The distinction and plurality of things comes from the intention of the first agent who is God. God has given being to things because of His goodness which He wishes to communicate and represent in them. And because a single creature would not suffice for this, He has produced many and diverse ones, in order that what is lacking in one to represent the divine goodness would be supplied by another. Thus, the goodness which in God is simple and uniform is in creatures multiple and fragmented. In such wise that the entire universe participates in the divine goodness and represents it more perfectly than any one creature whatever.¹²²

And yet the unity of the world is not achieved by the simple multiplication of beings. Thus as has already been said several times, the multiple could not be the end as multiple. The term of such an orientation would be the indefinite multitude, consequently unrealizable. The world would tend so to speak toward the confusion and formlessness of prime matter. “No agent proposes as an end for himself a purely material plurality, for a material plurality is without assignable term, as such it tends toward the indefinite, and the indefinite is repugnant to the idea of end.”¹²³ That is why the multiplication of individuals within a species cannot be an end. The perfection of the universe could not then consist in a plurality of individuals of the same species, but in a plurality of species. “*Universi enim perfectio attenditur quantum ad species, non quantum ad individua.*”¹²⁴

It must be said that the wisdom of God, cause of the distinction of beings, is also cause of their inequality. And this is the reason. There is a twofold distinction in beings, the one formal, in specifically different

things, the other material, in those which are only numerically different. But matter being in view of form, the material distinction is for the formal distinction. Thus we see that in incorruptible things (the pure spirits), there is only one individual to a species, for the species is preserved by one. In things subject to generation and corruption, there are many individuals of the same species, for the preservation of that species. Hence one sees that the formal distinction has more importance than the material distinction. But the formal distinction always requires inequality, for, as Aristotle explains in the *Metaphysics*, forms are like numbers whose species vary by addition or subtraction of units. That is why in natural things, species seemed ranked by degrees, the mixed more perfect than the elements, plants than minerals, animals than plants, and man than the other animals. In each of these orders of creatures, one species is superior to another. Therefore, just as the divine wisdom has caused the distinction of things in order that the universe be more perfect, so he is cause of inequality. For the universe would not be perfect if there were but one degree of goodness in things.¹²⁵

Consequently, the unity of the ensemble of the universe is constituted by a heterogeneous plurality. An ensemble or whole is of two kinds. "There is the homogeneous whole, composed of similar parts, and the heterogeneous whole whose parts are dissimilar. In a homogeneous whole, the parts constituting the whole have the same form of being as the whole, as each drop of water is water. . . . On the contrary, in a heterogeneous whole, no part has the form of the whole: no part of a house is a house, and no part of man is a man."¹²⁶

The ensemble of parts that compose the homogeneous whole constitute a material or accidental unity of order; the heterogeneous whole on the contrary constitutes a unity of the formal or *per se* order and is more perfect to the degree that it is more essential.

Things which constitute a *per se* order participate in the order more than do those making up an accidental order. But it is evident that among individuals of the same species there is only an accidental order; they participate indeed in the same nature and only differ among themselves according to individuating principles and different accidents, both purely

accidental with respect to the nature of the species. But in things which are different in species, there exists a *per se* order according to essential principles. In effect, in the hierarchy of species, the higher species contains the perfection of the lower species and surpasses them, much as in the series of whole numbers. But in inferior beings, which are generable and corruptible, which make up the lowest part of creation and which participate less in order, different things are not all arranged in a *per se* order; some among them make up only an accidental order, like the individuals of the same species. By contrast, in the upper regions of creation (in purely spiritual things) there does not exist any accidental order but only an order *per se*.¹²⁷

But it is in this unity of a formal or *per se* order that the perfection of the universe consists. "The essential perfection of the universe consists in species; accidental perfection in individuals. And as the multiplication of souls takes place within the same species, it follows that the multitude of souls that God creates each day does not contribute to the essential perfection of the universe, but only to its accidental perfection."¹²⁸ The unity that results from numerical plurality is not profound enough to be of the very essence of the universe, material distinction being necessarily a function of something else.

This idea raises a great difficulty. On the one hand, we say that the world tends toward unity, and that this unity is more profoundly realized in heterogeneity, but we also said that the hierarchy of infrahuman living things is purely functional and provisory.¹²⁹

This increasing variety of species is necessary in the world only insofar as it is found in a state of maturation. *Pertinent ad perfectionem universi sub motu existentis, non autem ad perfectionem universi simpliciter.*¹³⁰ Since the multiplication of individuals within a species is repugnant to the idea of an end, since the individuals of infrahuman living species are totally corruptible, it follows that the very existence of these species is naturally sacrificed to the human species, and that even the individuals of the latter cannot be infinitely multiplied. *Non autem potest esse finis multiplicatio animarum in infinitum, quia infinitum contrariatur rationi finis.*¹³¹ This on the one hand the heterogeneity of species is essential to the perfection of the universe, and on the other hand the hierarchy of biological species will be suppressed in the definitive state of the world. How to explain this paradox?

That the infrahuman living things are destined to disappear presents no special difficulty. Their sole reason for being is to contribute to the establishing of the world in its ultimate perfection. The sculptor does not adorn the statue with the hammer and chisel he used to make it nor the debris of rock. If plants and animals had perfections such that they could contribute to the perfection of the world in its future and definitive state, unity would demand their perpetuation. But such is not the case, for they are by definition purely functional. The perfection of an ensemble does not consist in what it has of the multiple or in its pure heterogeneity, but in the unity constituted by the coordination of parts, and not vice versa. When one can suppress the multiple without harming unity, unity only becomes more one and more dense. But the unity constituted by the multitude and diversity of biological species is actually diffused in the world. This unity will be preserved in the future, not by its diffusion, but in the intense unity of man where all the perfections now diffused in the biological species will be united in a single species.¹³² We said that the perfection of the universe consists in the coordination of parts. But it is important to distinguish two species of coordination: the objective coordination which is essentially perfection, and subjective coordination which is essentially imperfect. The former is a unity founded on the distinction of things, the latter is founded on their confusion.

Subjective coordination keeps things linked to one another in a more or less common subject by imposing on them their limitation. Thus natural things have a common matrix, the matter which makes them subjectively dependent on one another, and which is an obstacle to knowledge, that is, to objective presence. In this coordination things are prisoners of their subjectivity: *intus existens prohibet extraneum*. Knowers are perfect in the measure that their form emerges from matter. To know is to be the other as other. In the measure that natural things are subjectively coordinated, they are hidden from one another as objects: they communicate in the obscurity of matter, and not in form. So if we envisage natural forms, not in the sense that they emerge more from matter, but in the sense of their subjective coordination, this shades off into the homogeneity of prime matter which is pure limitation, negative indetermination, and one by defect of being.

But if we look at things in the perspective of their emancipation from matter, we observe that the more forms emerge from matter the more they are distanced from their common subject and the more that immateriality

makes them present to themselves and to that which they are not; the more independent and separate they are, the more they have an object, and the more profoundly they are coordinated among themselves in an objective fashion. The less things are subjectively approached, the more they are objectively present one to the other.

In the evolution of the cosmos we must see a tendency to emancipate from the subjective and from potentiality, that is, a tendency toward an ever more pure act and consequently a more objective one. The world flees the unity of matter and subjective coordination for which is substituted a progressive maturation of the object and a more profound objective coordination. Subjective separation is a condition of objective union.

Note however that the objective coordination which opens beings to one another as objects is not perfect by the fact that it involves the multiple, but because of the unity that commands this multiple. The absolute objectivity that God is is negation pure and simple of subject, since He is pure subsisting thought. He is the absolute separation from all subjectivity. Consequently one cannot speak of coordination in the metaphysical sense, that is, insofar as coordination involves the idea of distinct parts of the whole and is opposed to the perfect, but uniquely of absolute identity. Just as, because of the imperfection of prime matter, there cannot be in it subjective coordination, so because of his pure actuality, there cannot be in God objective coordination, insofar as this still implies a multiplicity of beings.

Subjective coordination is only truly vanquished by intelligence which alone can attain true objectivity. Sense knowledge can never totally escape matter and subjectivity. "The most perfect of [cosmic] forms, that is, the human soul, which is the end of all natural forms, has an operation which totally leaves matter behind, and which is not exercised by means of a bodily organ, namely understanding."¹³³ Consequently it is also on the side of intelligence that one should seek the unity of the world: unity conditioned by the distinction of things according to form and not by confusion in matter.

The plurality of intelligences alone does not answer to the idea of an end. Although human individuals are all of the same species, there is a certain hierarchy among them, and we even see that the more perfect they are the more they differ from one another. There is the most striking example of this in those most superior men who are the saints. This diversity thus constitutes a unity of order which imitates obliquely the unity of essential order.

The inorganic world and the human species are alone part of the ultimate perfection of our cosmos. But their specific difference is not sufficiently profound to be of the essence of the universe. In corporeity they have a common natural genus. It is this insufficiency of unity of essential order that enables St. Thomas to formulate an argument for the existence of the angels who are specifically different from one another and exist outside any natural genus. Our cosmic universe is only the bottom rung of the whole of creation, of the universe in a full sense, where a pure and essential unity of order reigns. Like an isolated angelic species, our whole cosmos is only a degree, the lowest, of the universal hierarchy. It is only in the ensemble of the created universe, that is, in the ensemble constituted by all the specific universes that are the angels and the cosmos, that we find that pure hierarchy which is of the very essence of the work of God.

This shows how much our theory differs from monist and pantheist theories. Monism, in effect, wants to take everything back to homogeneous unity. Pantheism, under the pretext of reducing the multiplicity of things to the greatest unity, pretends that God and the world are one; God is only the sum total of what exists, or the sum total of what exists represents only an aspect of the divine substance. These systems are at bottom pancosmic: everything is at the level of cosmic reality, everything is within the cosmos.

If we abhor these conceptions, it is not because we would be partisans of unity. We reject these systems because they can only give us an absolute pluralism, that is, a pluralism pushed to the diffusion of the unity by defect of being. They seek the unity of the cosmos in the confusion of things, in a subjective coordination, in a substantial unity of which the different natural beings would be only accidental or superficial manifestations. They see things upside down and elevate into an ideal the least real; what is for them the perfect state of the cosmos is for us its most imperfect state. Closing the cosmos on itself as being the only reality, the pantheist thus puts the most imperfect aspect of the most imperfect part of the created universe in the place of God. The logical term toward which monist and pantheist philosophers tend is nothing else than the pure homogeneity of prime matter, and worse they have to understand it not as an appetite and tendency toward form, but as a term and ideal toward which forms are borne. They are obliged to embrace the theory of David of Dinant who maintained most stupidly that God was prime matter.¹³⁴

By rejecting the multiplicity and substantial diversity in the cosmos one at the same time rejects what is most profoundly one: it is sufficiently one to give birth to multiplicity and diversity. Consider again this characteristic idea of pantheism according to which God is identified with things. Without any doubt it is necessary to place things as close to God as possible and to seek to find the profound coherence of beings. But it remains to know if the most intense unity will consist in the identity of all things, and if pantheism does not defeat its pretended desire for unity, the desire that animates it.

There is absolute unity in God alone: in His very unity He is absolutely distinct from every creature. But metaphysics also teaches us that by His immensity, God is more intimately in creatures than creatures are in themselves. It is because He is absolutely one and infinitely distinct from His creatures that He can be infinitely close to them. If He were confused with things not only would God be separated from Himself—which would be the negation of absolute unity—but He would not even exist profoundly in creatures. Putting aside the incomparable absurdity of this idea, things too would be deprived of their most intimate link, since God, their most profound principle of coherence, would be dispersed among them. The world would be like an army in disorder without a leader.