A DISSERTATION ON THE FORMATION OF THE WORLD

ANONYMOUS

*Felix qui potuit rerum cognoscere causas[[1]](#footnote-1) (Georgiq.)*

1738

##

##

##

##

## INTRODUCTION

I’m really not eager to discuss the formation of the world. I’m afraid of shocking my reader, without educating him. You, who have asked me to talk about the world, and whose wisely employed leisure has been used to delve deeply into the most abstract subject matter, must know what kind of abyss I’m falling into by satisfying you! I would have been happier to satisfy your expectations if you’d allowed me to handle my subject in that language which is so familiar to you, and which has served us so well in our conversations; but how will it provide us with all the expressions we’ll need? Another fear holds me back: the fact that my reflections might fall into the hands of an ignoramus, who’ll condemn me without hearing me. How many people are just like that! To think differently from the idiots is to be their enemies: and their number, which is so large, must make anyone hesitate. In vain would I protest with Horace on the uprightness of my intentions; *quid vero atque decens curo et rogo...* nobody will take me at my word*[[2]](#footnote-2)*. For the prejudiced, what is true and upright is... their prejudices. Anything that fails to uphold their prejudices is false.

Most men believe in a God, just as it was long believed that it was the Sun, and not the Earth, that turned. But what will become of this God if we rob Him of the use of that which is usually attributed to him, His Omnipotence, i.e., the creation and maintenance of the world? He would then be only a useless, even a powerless Being; at least by comparison with the great architect of the world. Another obstacle also keeps me from talking about the world. I’ve been one of the most active seekers after proofs of the religious system from its supporters: but, in the matter at hand, I can give nothing but the correct conclusions from bold conjectures: but my enemies won’t be content. They draw conclusions relative to their own interests; then they form a conventional principle. Only they have such a right. A conclusion drawn from a solid conjecture should be at least equal to that. But no. Our opponents have reserved all the advantage for themselves. Nevertheless, I’d agree with the famous Toland: “If my conclusion is sound, it’s certainly as good as your allegory.” In all the subjects I’ve handled, I’ve provided proofs: if not affirmative ones, at least negative ones: thus, I’m convinced that I’ve proved, not what the human soul is, but only that it’s impossible that a soul exists, at least as many nations claim it to be: i.e., spiritual and immortal. All savants agree that, where one cannot advance affirmative proofs, negative ones make up the difference, and have the same weight. Indeed, to prove that something cannot exist is as good as demonstrating its non-existence. I mention here this manner of proceeding, because I expect I will have to use it more than once in the course of this *Dissertation*. It may not match all your expectations; but I can assure you that I have exhausted all my sagacity in it. If I fall short of the goal, at least I won’t muddy the waters; I take pride in clarity, and I only write what I can clearly conceive of. When the subject resists, I surround myself with doubt; and you must have seen this method at work in any of my books which you’ve read.

I think there would be fewer errors in the world if all men thought like me on this subject, and like my great and venerable preceptor Montaigne, the most enlightened, perhaps, and the most skeptical of all men. Pherecydes, one of the Seven Sages of Greece, wrote to Thales before dying; “I’ve left orders,” he says, “to bring you my writings after my burial: if they satisfy you, if they receive the approbation of the other sages, publish them; if not, suppress them.” Be Thales; I’m no Pherecydes. If I resemble him at all, it’s only with respect to my uncertainty about everything that isn’t mathematically true.

It would be useless to warn you about the order I’ll observe in handling this subject. It has too few principles to require any divisions: still, two do come to mind: 1. The impossibility that God is the author of the world, in the sense in which this is usually meant: 2. That the world originates from itself.

Let’s begin.

## 1st CHAPTER: WHAT IS MATTER?

Every system [of thought] on the world depends on the solution to this question. We can consider matter either as deprived of movement and incapable of receiving it; or as having movement in itself; or, finally, as deprived of this same movement considered in general and without form, but at the same time as able to acquire and even produce movement, when it has acquired certain qualities, independent of any other being than itself.

1. We can't consider matter as absolutely deprived of motion, and incapable of receiving it. If this were the case, it would have been vain for God, or the First Cause, as many nations assert, to make it from nothing. In that case, it would have been able, at most, to fill a hole in the great Totality of the universe; and we would also have to assume it to have been created just where the void had been; for otherwise it would have been necessary to apply a kinetic force to it, in order to make it appear in the void it was destined to fill. Whatever the space is which matter occupies, is of no importance: and how could this void subsist in the spiritual world? Was that uncreated Essence not therefore infinite? For if it were, it would have been full already, full of something or other, and there would have been no room for matter.

The Spiritual Essence preceding the material essence, couldn’t be such unless it were also single and indivisible. And yet, we can’t consider any void, and consequently any interval, as able to be filled by matter, in an Essence whose nature is unity and indivisibility.

If there was no empty space in the spiritual world, then either the first Essence would have to withdraw, compressing itself into a reduced volume, or new space would have to be created. But, in the first case, the first Essence wouldn’t completely fill all the dimensions of the great totality; for it’s vain to compress fluids; once the container was full, it could receive no more, *a fortiori*, once the *Totality* was full of the first essence, it should have been entirely full. And this precision in keeping with the unity and indivisibility of the nature of this Essence: the first Essence couldn’t withdraw into itself, to make room for matter, for such a *compression* would imply the existence of a space in the container empty of that which is *compressed*. And if it were possible to prove that the Divinity was compressed, this would also prove that His Essence is not infinite; since it would necessarily have to contain many lacunae which, when added together, would form a space as large as that which matter now occupies; and then God would not correspond to the idea which so many nations have formed of Him. Those who believe this consider Him as that which is most perfect; most infinite: but in the hypothesis in which He has drawn back into himself, we could conceive a Being more perfect than Him; that is, a Being whose essence would entirely fill all the dimensions of the great Totality, such that there would no longer be room for anything else.

It would be futile to object here divine Omnipotence. If the divine Essence filled everything, then there wouldn’t be anything else. God cannot destroy a part of his Essence, since it has no parts, and, since unity and indivisibility are annexed to it, if He destroyed the least part of this Essence, He would destroy it completely. Nor could He shrink it: for then He would be taking something away from its infinity; and to conceive of an infinite Being after this *shrinking*, we would have to add matter to it. Which would lead to this proposition: God + matter = the Infinite.

It may be replied that the spiritual Essence doesn’t occupy any space. But, if God and His Angels, the Devil and his own don’t fill and don’t occupy any place, what then does fill the immensity of space? I cannot see, in any people’s holy book, the idea that God created space. It therefore existed. If the Spiritual essence required no space, why did this extension exist? It’s absurd to suppose that God, or even Nature, blind as it is, made anything in vain; but the space in question, where no Spiritual Essence dwelt, nevertheless existed; therefore it was occupied; matter didn’t exist yet, therefore the spiritual essence must have filled it. But the Spiritual Essence occupies no space: therefore, matter came to fill it up. We cannot Escape this circle, unless our opponents, with their ever-fertile imaginations, invent a third Substance or Essence to fill the local extension of the immensity. But no matter what Being occupied this space prior to the formation of the present and tangible world, it must have a name. It can’t be God, or the uncreated and spiritual essence; for we have seen that if it had indeed filled it, then matter wouldn’t have been put there: neither can it be matter; for this would mean that matter is eternal, otherwise we would fall back into the circle, and the first question would return: what occupied this space before matter? This, our opponents might say, is the precisive Being, Being in general. Let’s cast some light on these obscure terms. Being in general, the precisive Being, is neither the Infinite, nor the finite: this idea includes both. It is the genus and not the species of the finite and the Infinite: in a word, is *prescinds* these two Extremes. Upon which, I observe that such a Being could never fill the immensity, nor could even exist. It might well prescind God, who is thought eternal; but it could not be a part of matter, which didn’t yet exist. Therefore, there would be empty space, and an unoccupied, immense extension: which is absurd.

This extension had a particular form and boundaries: this is undeniable. Its boundaries were either formed by the infinite Essence, or by certain bodies: this is beyond doubt. But if these boundaries were spiritual, then it’s possible to divide spirituality: for, between the spiritual boundary on the right and that of the left, there was empty space: but this space is the essential characteristic of the division of the parts in which it’s found.

If, on the other hand, it’s said that the boundaries of the void were material: then I would have to conclude that a certain quantity of matter existed from the first instant, or rather eternally. Therefore, matter is eternal. But let’s pass to the second proposition which supposes that God created the space which matter occupies.

Not only does no Holy book, nor any tradition, speak of such a creation, but it’s impossible. The divine Essence requires no space: therefore, it has no idea of it: otherwise, God thinks about vague and futile things. It’s claimed that God had this idea. Did He have it from all eternity? No doubt? Then He must have created space from all eternity: for the ideas of God are always made into realities; unless one would venture that there is a division between His power and His will. God either had or He didn’t have the idea of essence eternally. This idea represented space to Him as something that either should or should not exist. If as something that shouldn’t exist, then He must simultaneously have the notion of the Good or evil which would result from it; if evil, then He should not have created space; if Good, He must have created it from all eternity; for Good couldn’t appear too soon. I will go further. The infinite Essence has the idea of Space: where does this idea come from? It can’t come from itself; for it can’t have the idea of something that’s bad; who, then, gives ideas to the First Cause? It’s insisted: God had this idea in Himself, if He had it, He had it from all eternity: otherwise, He was ignorant from the first moment of Eternity until the moment when He conceived this idea. If He had this idea, He must have made it real as soon as He acquired it: for this realization was either good or bad: if bad, He must have stopped the bad circumstances that came with it: if good, why postpone it at all? Let’s proceed.

Space, considered in the abstract, is not a body; but it must have a Body as its object. It requires a basis. God creates space, He cannot do so upon spirituality, since it has no extension. He must therefore constitute extension upon matter; but then matter is prior to extension, to space; which is absurd. Matter could not exist for a single instant without its essential property, which is extension. Here is an enormous contradiction in the system of religious philosophers. According to them, God creates matter in a time where space already existed, but can we really imagine that a property exists before the subject of which it is a property? It’s like wanting heat to exist before fire.

If we follow the hypotheses adopted by our opponents, we will fall into the labyrinth. If God filled everything, not only would the container prove that it can take in nothing further, but also the increase of a new space by way of creation is impossible; for then God is no longer Infinite, in the strict sense; He is only infinite *ad tempus*, and only with respect to the space of that time; but not with respect to that which must exist later on. What law, superior to the First Cause, forces Him to create a new space which takes His Infinity from Him? This is an important question, and one which deserves an answer from the partisans of the religious system. The reply will come that space neither adds nor takes anything from the infinity of God, since He occupies none: but if He doesn’t occupy any then, just as a property couldn’t exist without its subject, and the infinite Essence couldn’t be the subject of extension; therefore, since matter is the subject of the property of extension, which has always existed, matter is as eternal as extension.

The subtlest sophists among our adversaries consider the Spiritual Essence without any Extension, and, like a mathematical point, without length, width, or depth. This is a fine idea; but is it apt? Let me join them and think of God as a point. So far so good; but where was space, and who filled it? Not God; therefore, matter. On the horns of this dilemma, our adversaries opt to have God creating space. But does He occupy this space? Yes? Then He isn’t a point: then He occupies, and his Essence includes extension. No? Then He is not infinite.

The creation of space is an absurdity; space is not a substance; it is the property of a substance; which is quite different. If space had always existed, there would always have been matter: but there has always been space: therefore matter is eternal. For 1. God was unable to create space, as we’ve just seen. 2. The Spiritual Essence could not be its subject, since it occupies none, as is claimed. 3. If it [the Spiritual Essence] did occupy it [space], then matter could find no place there; otherwise, it [the Spiritual Essence] is not infinite. 4. If it occupied it and it is infinite, then it couldn’t be *contracted*; for the possibility of being *contracted* relies on the existence of empty space, and empty space requires divisibility. These, in part, are the contradictions we encounter when we make God create matter. But we cannot consider it as lacking movement and incapable of receiving it without this creation; but this creation is impossible: therefore, it didn't take place. That is metaphysically probable.

2. The Thesis changes, if we consider matter as having movement in itself. This is what we have proposed in second place in this chapter.

And to begin, if matter has motion in itself, it could not be the workmanship of any Being superior to its nature. Let’s develop this proposition. To be endowed with movement is absolutely different from being moved. The former is to possess it; the latter is to acquire it. If matter is thought to have been created, then it couldn’t have acquired its own movement; it could, at most, have had the capacity to be moved. In this hypothesis, the property of self-movement is only accidental to it. The real question is whether motion, applied to matter, is impressed upon it by a successive law, which only works relative to circumstances, or whether it’s a generic force which constantly operates upon the inert body of matter? This we do not know. In either case, though, it must always be the author of matter which causes its motions. If it’s applied successively and relative to circumstances, then matter may certainly not always have existed. For then, God can take motion from it again: but this superiority of His will cost Him dear. This successive application of motion makes Him responsible for all the evil that occurs in the world; and it’s easy to see how. Hatred, murder, in sum, every kind of crime punished by society, is the result of the affections excited in us by certain motions. It’s by the laws of attraction or repulsion, by centrifugal and centripetal forces, that everything is either attracted or repelled by everything else in nature; that everything loves or abhors everything else. And these laws are the effects of the action of the Principle of Motion: this Principle is God, and, in this hypothesis, cannot be anything else. Therefore, God is the author of all the evil that occurs in nature.

If the motion impressed on matter is generic, applied once and for all, it can be considered either as performing all the operations of matter, or as producing an indeterminate force in it, by virtue of which it can be applied to particular actions, without following its generic movement. In the first case, the principle which performs all the operations of matter is also God, who must answer for all the evil it does: for matter always has to follow its current impetus. In the second, God is not the author of evil; but nor is He then the author of good: for whatever acts matter is led to carry out, it’s no longer due to the impetus of the First Principle; but instead due to its own will, which it performs with its endowment of an unrestricted power of self-movement. This opinion, which seems to rescue the goodness of the First cause, entails many difficulties; for this power of moving and producing acts would imply either knowledge in the Being to which it is given, or imbecility in Him who bestows it. To grant an unrestricted power to a blind Being is to risk ruining everything; for, ultimately, such a Being can quite easily produce only evil, and this blamelessly; for, by following its blind impulses, it breaks no laws; it only exercises the Power which was, unwisely, bestowed on it.

But let’s abandon these chimerical hypotheses. Let’s cut right through the difficulty: God cannot have given to matter either an unrestricted power of motion, or applied a particular movement to it which constantly guides it. If all is *Unity* in God, then with all the more reason are His attributes indivisible, considering each individually. This truth is maintained by the [Aristotelian] Schools, and with good reason: indeed, since divisibility is the essential characteristic of matter, indivisibility properly becomes the characteristic mark of spirituality, which is diametrically opposed to matter. On this basis, I say that it’s impossible for God to have communicated any kind of motion to matter; and here’s how I shall prove it. The attributes of God, considered individually, are indivisible; considered in general, they enjoy the same prerogative: but motion, which is nothing other than life, is an attribute of God: therefore, it is indivisible. But if motion is indivisible, then it’s also incommunicable, whether we consider the attributes of God *en masse* or individually. Unity and indivisibility necessarily imply incommunicability. Therefore, God could not have communicated motion to matter. Had he communicated the least portion of one of His attributes to any substance whatsoever, not only would He be handing over the entire attribute to this substance, but this gift of God’s would also entail the transmission of all the rest of His attributes: that is, of all the perfections of the Divinity; for, as I’ve just shown, just as each attribute, considered separately, is indivisible, so each attribute considered *en masse* is mutually indivisible: otherwise these things which are called spiritual would bear the characteristic sign of materiality; i.e., divisibility. Hence, we can certainly conclude that if God has communicated motion to matter, not only would He have given it all the motion that had resided in Him, but all the other attributes or perfections too. But God is not a body: He is nothing other than the infinite aggregation of perfections: therefore, deprived of this infinity of perfections, He is reduced to zero.

God could not create a particular movement to apply it once and for all, or even successively, to matter. God possessed the infinity of all possible perfections: but there is nothing beyond the possible infinity. If God created new perfections, these perfections would be *More-than-infinity*: which is absurd.

The authors of the System of the First Cause were not geometers. They failed to conceive that by giving Him the attribute of infinity, they would limit this Cause to itself, and thereby exclude all other substance but its own. It is true that the Omnipotence of their First Cause has served them as a great help in their extravagant suppositions; but this scarecrow no longer has any place once reason comes into the picture. For the same reason that it’s impossible for the totality to be smaller than its part, it’s impossible for anything at all to exist beyond infinity. If the whole universe were material, would it not be contradictory to say that a spiritual substance reigns throughout the whole? For the same reason if, from all Eternity, the Great Whole has been filled with the spiritual and infinite substance, then it’s impossible for matter to have been admitted there too. Infinity means the exclusion of all boundaries: God is this Infinity: therefore, He excludes any boundaries: but beyond the bounds of the Infinite; that is, beyond the exclusion of any boundaries, there cannot be anything. Therefore, matter, beyond the infinite and its boundaries, is a substance which exists within the Nothingness: I mean a chimera, a revolting absurdity.

When we conceive of an infinite and eternal substance, we are excluding any creation subsequent to this substance, since our idea of Infinite existence already contains immensity, and excludes every kind of boundary. Let us return.

We couldn’t consider motion as being inherent to matter; for where would it get this movement from, either from the First Cause, which, it’s thought, created it, or from itself? It is impossible for it to have come from God: motion, which is life or being, is an attribute of God’s, therefore an indivisible, incommunicable thing. The fact remains that matter had movement in itself, that movement was part thereof, an essential property thereof, like extension, color, shape, etc., which are the properties of sensible bodies and even of those we don’t perceive.

In this hypothesis, I ask whether motion has always been inherent matter or not? If it has always been inherent to it, then it is eternal: if not, where did it come from? God couldn’t have communicated it to it: we’ve shown this already. But it couldn’t communicate it to itself. Motion is a principle: principles are always coexistent with the substances in which they are found: otherwise, the effects, the accidents found in a substance would be children without parents, effects without causes. Thus matter, considered in general, and setting aside its motion and its forms, never acquired, by itself, at a certain time, motion. Where, then, would its movement have come from? What Cause, other than the First One, could have produced it in matter?

If unformed matter, without any modes, possessed in itself the Principle of movement, then the universe couldn’t exist for a single moment; for the principle included with the mass would affect all the parts of this mass, and no bodies would ever be at rest: which would unfailingly soon lead to generalized disorder. Yet, we have experience that some bodies, even those which are least often moved, are in the most perfect repose. We shouldn’t reason against experience, for as dazzling as a contrary hypothesis may be, it can never win.

It might be supposed that motion is not inherent to all the parts of matter: but this supposition does nothing to save the difficulty; for it would be necessary for men, in the forms they give to the parts of matter they use, to be able to discern between the material portions which are endowed with motion and those which are deprived of it.

If motion were inherent in matter as a Principle, it would be vain to separate the parts from the general mass, to put them to use. The generic principle would be inextinguishable up to the Entities; for nobody can destroy the essential properties of substances without destroying the substances themselves: you would have to destroy fire if you wanted to keep it from burning.

I will finish this section by responding to an objection which will certainly be raised concerning what I’ve just said: that is, that we have found the art of stabilizing certain substances which are nomadic by nature; but I maintain that this is false. It’s almost always wrong to call a substance, that which is only a mode. There is only one substance in the world, matter. Mercury, for example, is an active mode, and motion is a property of this mode; we capture mercury, that is, we slow its action by disturbing its nature into crass and fine parts; this obstacle we oppose to it doesn’t completely deprive it of its active property: witness the effect it produces on bodies where it’s applied after it is what we call stabilized. But if we could make it absolutely immobile and incapable of any action, we’d have no better grounds for flattering ourselves at having destroyed the essential property of a Substance: at most, we would have decomposed a mode, an accident of the Substance. All the skill in this case lies in excluding the moving parts from other parts which are at *rest*; in separating them from effects, in relating them to principles. Thus when we put fire out, we halt an effect which has certain preconditions; when we remove these conditions, the apparent effect ceases. But this fire is only a mode, an accident, and it would be ridiculous to say that we destroy the substance of the fire when we withdraw the conditions for the fire, i.e., combustible materials.

When I’ve said that one couldn’t destroy the essential properties of the Substances, without destroying the substances themselves, I’ve wandered into absurdity, and concluded on what is called absurdity.

From this Principle, that it is impossible to destroy the properties of the substances without destroying the Substances themselves, it necessarily follows that motion is not inherent to matter as a Property annexed to its general Being, without considering its modifications. To destroy motion, an essential property of matter, would be to destroy matter itself, that is, its very substance; which is impossible: yet we can stabilize portions of matter, and put them to rest, if they don’t have it [motion], and put them to different uses; we even detach most of their mass from them, in which we can perceive no motion and which acquires none afterwards: therefore, motion is not inherent to matter, from a generic point of view. From the fact that some of its parts move, we can’t conclude that the principle of motion is inherent to its substance; but only that its parts have been found in circumstances where they have acquired it; such that motion is an accident in them, and not a principle, as some materialists have maintained. This conclusion, incorrectly drawn from the particular to the general, has allowed our opponents to draw the conclusion, by the same procedure, in favor of the inertia of matter. They have taken a portion of matter, which was both motionless and unable to move, from its original matrix and placed it in shackles, then argued and aptly drawn their conclusion, in keeping with this principle. But an opinion is not always a truth. People have been misled on both sides because they have not always proceeded according to basic principles. The hypothesis which renders motion inherent to matter, as an essential property, is as favorable to the religious System as it is to materialism. If matter has motion in itself, where does it come from? Not from itself. For then this generic and active principle would set all particles in perpetual motion, which is contrary to experience. Therefore, the Partisans of the First Cause would conclude that that’s where it comes from.

I therefore find it equally improbable that matter, considered in general, is absolutely deprived of motion and incapable of acquiring it, and that motion is inherent to it, that it’s an essential property of substance, like color, weight, extension, form, etc. It may be more correct to think of this Substance as we do about those things which, with the help of various preparations, seem to become something else. It’s from this third point of view that we’ll treat our subject.

3. After having reflected on this important point and having noted that nearly all the hypotheses on nature were false, and that the most satisfying among them were repugnant to probability when you stopped to analyze them, I decided to consider my object from another point of view. It’s also important to say neither too much, nor too little. I don’t set myself up as the apostle of matter; but nor would I be its *Despiser*. To say that matter has what it doesn’t; to deprive it of its properties in general, appear to be two extremes which are equally dangerous and contrary to the progress of the truth.

There is only one Substance in the world, of which what are called Elements – air, fire, earth, and water – are only modifications, accidents. It seems obvious that there was a time when such things didn’t have any existence of their own. Jumbled together, and forming only a fine fluid, less liquid than Water, finer than Earth; less hot than fire, warmer than ice; of no determinate quality, but partly possessing all of them. This Totality without qualities, without form, or at least having only one, filled all of space; or rather it was the object of space: to posit any movement of matter in this State would make the effect precede the cause. To set an object in motion it must be surrounded by empty space; not an absolute vacuum, but it must be surrounded by bodies which are more supple than itself: otherwise, since the resistance would be equal to the force, the object would remain in its fetters; the one next to it would have no more liberty than it [the object] does itself, and so on to infinity.

Movement is an action; and every action presupposes force in the bodies which possess it: but in a Totality, no part of which has any existence of its own, neither force nor weakness can be posited. Extension is different; matter couldn’t exist for a single moment without this Property, whether it was fine, or even liquid; whether it had both of these natures. We couldn’t consider any material point, without also acquiring the idea of some extension. On the other hand, we consider the particles of matter without motion: how so? Because Extension is an essential property of matter; and motion is not of this genus.

However we handle it, we cannot pin our attention to any physical Being, without gaining an idea of its essential property. The idea of Water brings the idea of fluidity; that of fire, that of heat, etc. The idea of Life especially brings that of movement: thus, motion is the essential property of Life, and, properly speaking, of Being: all matter is not alive; therefore, motion is not an essential property of matter.

We also conceive of many parts of matter as absolutely deprived of motion; but we simultaneously conceive that, through certain aspects of the harmonious union of these parts, or the exclusion of some of them, they might acquire motion: therefore, motion is not Essential to matter. If motion were essential to matter, we couldn’t consider any portion of matter without also thinking of motion; just as we couldn’t pay attention to the portions of this same matter which are animated, without also thinking about movement.

It is, therefore, equally far from true that motion is inherent to matter, and that it is incapable of acquiring it. If it were inherent to it, then this essential property would be found in all its parts, since essential properties never abandon their subjects. And if it couldn’t acquire it, then no bodies could even exist, which is contrary to experience; for all the sophisms of the Pyrrhonists could never destroy our notions of existence, based on the resistance of certain bodies which stop us, and on the action of certain others which have a repulsive effect on us.

The motion of some material bodies, and the rest enjoyed by others necessarily leads us to the conclusion that matter, considered as such and deprived of certain conditions, of forms, of all modes, is also deprived of motion. This concedes a great deal to our opponents; but, to combat falsehood, we must not use falsehood. We have no interest in deceiving ourselves. If, by our research, we discover the truth, we’ll praise it. A great number of Philosophers have thought matter to be eternal; others have seen it as the workmanship of a First Cause: one of these two branches of Philosophy must be mistaken. I join neither party: I seek the truth. The difficulty or ease we find in an opinion is no sure measure of its truth. The system of the inertia of matter is very convenient; but it is repugnant. A lazy mind may be content with it; for what is less bothersome than to gratuitously assume unknown principles, a First Cause, of whose existence one has no other notion but the idea, perhaps artificial, if not absolutely false, of those who preach it?

I can already see the partisans of the First Cause greedily seizing on my confession that matter, as matter, is not endowed with any motion of its own. Yet, they’ll say, nothing can acquire what it doesn’t have; and yet portions of matter do move; therefore, some Cause prior to matter gives motion to it. Let’s slow down. These general conclusions are certainly stunning: but, to stun is not to educate. Similarly, a general famine in a State doesn’t strictly imply the reality of famine for all its individual members without exception; in the same way, if the general mass of matter is absolutely deprived of movement, it doesn’t follow that certain portions of this mass cannot acquire it. Finally, despite the advantages which my enemies think they find in my confession, I stick by it. Matter is a substance deprived of movement, considered as a substance, and without forms; this I maintain. But I deny that it remains eternally in this state of inertia; I even affirm that that is impossible.

Since error usually comes from going too fast, and from the way in which, proceeding too generally, people confuse causes and effects, and make accidents into subjects, it is best to advance step by step in this matter. In this way, if we don’t attain reach the truth, at least we’ll avoid any illusions.

## 2nd CHAPTER: WHAT THE ORIGINAL FORM OF MATTER MUST HAVE BEEN

The economy of the universe, as we now know it, indicates that the great Totality of this Universe was, originally, only a mass composed of fluid and dryness, of softness and firmness. These original qualities are found in all particles of matter. In these particles we find some which have been liquefied by a longer process of purification, and others which this same purification has hardened, such as water and marble. But within the class of these two portions of matter which are so divergent, we discover some which haven’t yet been able to reach perfection. These modes of matter are like children who are not yet formed in their mother’s womb, which would require much more time to reach maturity. All these modes are of a mixed nature, constituted by fluid and dryness, by the soft and the hard; therefore the original quality of matter has something of both natures. If matter had stayed in its original phase, that is, eternally liquid, there would have been no hard bodies anywhere; if nature had originally been compactness, hardness, we would find no spongy, soft, or liquid bodies anywhere. The passage of time fully liquefied or compacted the material particles: therefore, these particles were, primordially in a mixed state. Proof of this can be found in the unformed portions which we find there. If we open the bosom of the Earth: there, where many centuries later we would have found marble of an extreme hardness, we will only find layers of a material participating of both fluidity and compactness. It’s not yet marble; but it’s not water either. The same thing occurs in metal and mineral mines. In a mercury mine, for example, the agents best suited to the formation of this mineral are found in the form of earthy globules, when they’re not yet matured. Open this mine again later; wait a certain amount of time, and you’ll find the liquefaction complete. Thus, the original quality of matter is neither fluidity nor compactness, but a mixed nature.

If all had been compact at the origin of things, all would have remained in this same state; there would have been no room for movement. Likewise, and for a similar reason, if all had been liquid. We cannot conceive motion, or action, in a totality whose parts are of a single nature. Motion presupposes diversity in the object which is moved. If you fill a vase right to the top, with liquids or solids, you will be excluding all motion from it. But introduce into this same vase bodies of different natures, solids and fluids, both of which are necessary agents for the formation of a mixed substance; shake this vase, after sealing it carefully, and you’ll find motion inside.

We cannot therefore consider matter from another point of view than that of a mixed substance. The hard part is to give it a form, a shape in this state.

Roundness is a shape which I would be happy to adopt, if only because this shape implies that the great totality has a shell. But wouldn’t this be making the effect precede the cause, to suppose that nature was a shell in its original state, since this shell must have only been the effect of a purification by virtue of which the coarser parts were driven outward to the extremities by the action of the central fire?

A mixed mass that’s neither compact nor liquid presupposes, if we give it roundness for its shape, a Container around it. This container could only be thought of as a solid object, or at least more solid than its Content, otherwise the mixed substance would expand in a straight line; for circular motion is harmonic; and cannot be received into motionless matter, since motion is a precondition for harmony.

Would it not be vain for us to seek to determine the original shape of matter? I do think so. Matter contained the Immensity; and what shape could we ever give to this immensity? We can’t give it any shape at all unless we also posit a shell, or at least a vortex, to contain it; but then the contained substance would no longer be infinite. Besides, this shell or this vortex would need to be infinite itself, otherwise we could ask what lies beyond it?

Extension is the essential property of matter; space has no existence of its own: which is only a way of looking at Extension: we cannot separate the idea of extension from that of space: therefore, they are one and the same thing. Extension and space are not and cannot be prior to the substance whose property they are, to the substance which is their object. Therefore, it is useless to ask what Extension or Space matter occupied. To occupy implies posteriority in relation to that which is *occupied*. Therefore, it was unnecessary for matter to occupy space. But it was necessary for Extension and space to be found wherever there was matter. Wherever substance is, there its essential property is also.

The Totality, that is, the immensity, considered as excluding all boundaries, all limits; is what filled and which still fills material substance, but when we exclude all boundaries, we exclude all forms, any determinate shape. We couldn’t conceive a circle or a square without the idea of their boundaries being annexed to this conception. I search my imagination in vain, unable to give any shape to infinite substance. The infinite excludes every limitation; the finite is its opposite, precisely because it has limitations; therefore, the exclusion or inclusion of boundaries is what distinguishes the Infinite from the Finite. But the idea of shape entails the Inclusion of boundaries, and depends on it: the inclusion of boundaries is the property of the finite, it is the precondition for shape: therefore, let us conclude, the infinite Substance, deprived of boundaries, and consequently any conditions for shape, has none at all.

If unity were essentially attached to matter, it wouldn’t have been able to assume any forms; but how could this be maintained, when experience shows us that even its smallest parts are infinitely divisible? This divisibility is the very thing that gives it its productive faculty. And God’s unity is what deprives Him of the same faculty. If there is a spiritual, infinite substance in the world, then all is spiritual, infinite: All Beings are only objective, or chimerical; and then the cannonball which crashes into the wall has no more density than a sponge: which would contradict experience.

The acts of resistance and the various shocks attest to the existence of Bodies: these distinct bodies prove the divisibility of the matter of which they are constituted. That is beyond dispute. This divisibility gives us the idea of matter, of which it is an essential characteristic: and we verify the reality of this idea by our employment of various portions of matter. On the contrary, if we could make God produce corporeal Beings, as He is thought infinite, we must necessarily separate, at least in thought, these produced Beings, from the producing Substance: And then we are beset by absurdity; for how can we separate a spiritual Infinity?

The Existence of God, and that of matter, together form a jumble of highly extravagant propositions, like these. God, infinite, and Matter, finite, together form the Infinite: the infinite substance is contracted to make room for finite substance; or rather: finite substance is placed outside the infinite which excludes any boundaries. Or even: infinite substance occupies no space; however, space is filled: space can only be infinite, it’s matter, or God, who occupies it. It is, therefore, finite matter that fills infinite space; for God occupies no particular place. Let he who is capable develop such propositions; but I don’t think this is possible on the basis of any principle whatsoever.

The habit of considering shape in all the parts of the material substance which come within our reach, and the impossibility of giving any determinate shape to this same substance whose boundaries we couldn’t either perceive or conceive, might be what led to the supposition of a first Cause, of an immaterial substance, without form or shape. Such generic conclusions flatter our laziness. Material substance, considered in general, has no shape; and yet configured Bodies exist: nothing can bestow what it doesn’t have: therefore, there is another substance besides matter, which confers shapes on its parts: a First cause, ultimately, a God.

It would have been more reasonable to conclude, from the fact that material substance has no shape, that it was infinite, since shapes require boundaries, and can’t be conceived otherwise.

Here is matter reduced to the State desired by the Partisans of the First Cause; that is, without movement and without form. This is granting a lot. They have won; but their joy will be short-lived: I only take it away in order to bring it back more gloriously. We will see it acquiring movement, if not in general, at least in its parts.

##

## 3rd CHAPTER: HOW THE MATERIAL SUBSTANCE WAS ABLE TO ACQUIRE MOVEMENT

We could not conceive of a mixed substance, possessing both fluidity and compactness, without also conceiving of the diversity in its constituent parts. The solid, exclusive of all liquid, would never produce it: the liquid, exclusive all solidity, could never, of itself and without the intervention of a foreign agent, produce the solid. Therefore, material substance must have been mixed, originally.

Since the parts of the material Substance could only be diverse, they cannot have stayed at rest for long. The basic feature of liquid is to decompose and divide. The less fine particles being penetrated by the surrounding moisture, the result of this penetration must have been, 1. The deterioration of the less fine bodies, 2. The purification of the liquid which penetrated them. Our filters are convincing evidence of this eventuality.

Once the less fine bodies were deteriorated, now too weak to hold up the finer and more compact bodies arranged perpendicularly above them, they were forced, due to their weight, to give way and open a passage. These superior bodies found it much easier to acquire this first degree of movement since the moisture, acting on them along with the less fine ones, and unable to penetrate them, far from having reducing their volume, must instead have increased it, given the silty character of this moisture; yet, just as it is purified while penetrating the less fine bodies, so also must it leave some of its clay with the harder bodies it seeks to penetrate, thereby increasing the weight of their mass.

The fall of these superior bodies must have led to the elevation of some others of lesser weight. Toss a bit of sugar into a vase filled with water, and you’ll see the effect of this pressure.

The less fine bodies, diversified by the action of the moisture, necessarily thickened the moisture; and from this thickening, the finer bodies must have received new growths from the silty humor which the moisture communicated to them in its efforts to penetrate them. Their fall must even have increased their volume.

As with more or less moisture, so with more or less dryness; in brief, since the mixed nature was equally supreme through all the dimensions of the material substance, and since equal antiquity gave to all the parts of this substance the same degree of action and resistance, force and weakness, many pieces of the great totality must have been set into motion at the same instant.

In these first instants of motion excited by the falling of the bodies, all the surfaces imbibed in the moisture were spongy, soft, flexible, and consequently susceptible to loss and growth. When those bodies which were most angular came into contact with large and soft surfaces, they necessarily formed connections, with the heavier ones drawing the others in their own direction. To the extent that these Bodies were carried by their weight toward the outer extremities of the mass, their expulsion led the lighter parts to the center. The middle kind of bodies must also have gravitated toward the center, but since the lighter ones were faster and got there first, they were unable to go there, and were trapped in the middle part of the general mass.

Some parts of the fire, that is, the lighter portions of the matter, having been placed in the center, must have acted on the finer parts beside them. When dryness came on the heels of the moisture in these neighboring parts, their finer parts was devoured or converted into fire. Their denser corpuscles, drawn by their own weight, after having exhausted the surrounding moisture to some degree, thereby increasing their volume in all their coarser aspects, must have grown apart and taken their explosion from the center towards the extremities. All these explosions of the denser parts towards the extremities certainly increased the volume of light elements which occupied the center by driving there all the lighter parts of the Bodies that were falling.

I wouldn’t venture to decide here whether fire existed and was divided through the general mass of matter. This Element may well have been only the product of the shocks and friction caused by the falling of the bodies from the center of the immensity toward its extremities. There may then have been various materials, especially the parts putrefied by the moisture, which could have made fire by their intense friction with each other. We see portions of matter set on fire under less intense and long-lasting agitation than what must have been produced by the falling of the bodies from the center of the mass toward its extremities. Then fire wouldn’t be a substance. It would be an effect, not a Cause. The way fire is maintained in nature doesn’t destroy this View. Once this quality has been produced by the friction of the combustible parts, it would have been intense enough to convert the neighboring bodies into its own nature; and since fire attracts light bodies to itself, it is thereby maintained in a volume proportionate to the distance of the bodies with which it exchanges its heat. In brief, we only too often see fire as the effect of various Causes, to think of it as a principle; and more than one savant has shared my view on this point.

Whatever the case may be with fire, it cannot have been the principle of the primitive movement: once produced; it might have served to maintain it, to augment it with its attractive and repulsive forces. In nature, water is the true dominant principle, whether we consider this element as degrading or even as destroying the Bodies, whether it’s considered as penetrating them and introducing into them the various natures which water carries, and to which it bestows, in the act of putrefying them, the quality of being easily digested by the elements into which it is introduced.

If the material substance hadn’t been mixed, with aridity and dryness being dominant, the repose of the various parts of the mass would have been eternal; but the moisture, undermining by its action all the more or less firm bodies which were mixed with it, which forming only a single humor embroiled within itself, and, by this means, broke the eternal columns of Infinite Substance. Motion has existed ever since this rupture; not that it had a separate existence like the bodies; but rather a resultant existence, with more or less force relative to the weight of the bodies which produced it.

In a Totality possessing the nature of the fluid and the fine, the dissolution of a single body, caused by the penetration of the moisture, was all it took to set all the other bodies in motion.

But it cannot be supposed that this dissolution occurred in only one part of the great Totality, and with respect to a single body. The moisture was dominant everywhere, and there were more or less fine bodies everywhere, bodies liable to be penetrated, along with others capable of resistance. All these bodies, with their diverse qualities, were in equal weight spread throughout the immensity: otherwise, matter couldn’t have been at rest. The perfect equilibrium of all the parts of a mass brings about a condition of perfect rest within this mass. But the equilibrium is nothing other than equal weights. It was therefore necessary to break the equilibrium, to set matter in motion. Only the moisture could do that, with its ability to destabilize and degrade, to penetrate and dissolve the less fine bodies, and with this dissolution to cause the falling of the denser bodies which were carried by the less fine ones: but the moisture was spread throughout the whole: everywhere it carried with itself its essential power of penetration: therefore the rupture of the equilibrium must have happened simultaneously in all the dimensions of the Totality: therefore, the falling of the denser bodies must have been multiplied everywhere: therefore, the motion of the bodies must have come about everywhere at the same instant.

Truly solid bodies have no motion: to set them in motion, you have to apply an agent to them which is stronger than themselves. Bodies of this nature wouldn’t, therefore, be able to trace anything but a straight line in their fall. Therefore, the denser bodies of the great totality, maintaining equilibrium in their fall, could only have moved toward the Extremities of the great Mass.

Given its lightness, the fire produced by the explosion of the bodies reached the center first, and so the center was filled with it. But it doesn’t matter by what a space is filled: as long as it’s full, other bodies can’t reside there. So, when the center was occupied by the fire, it could take in no bodies but those which the fire had devoured and converted into its own nature. But the effect cannot be superior to its Cause: therefore, the fire, produced by the friction of the bodies and only an accident resulting from their diverse collisions, couldn’t have acquired sufficient volume to prevail over the other bodies. Moisture is its enemy and destroys it. All bodies had some of this moisture in themselves: the fire, therefore, had to dry them out before it could devour any of these bodies. But this would both diminish and upset its action. The fire couldn’t try to increase its volume: the bodies it devours are moist enough for it to cost it as much as it gains by devouring them. The general mass loses nothing by its action. Since it is all, and the substances are indestructible, its weight is always the same. Fire doesn’t destroy, it only decomposes. Any particular body can only have dense and moisture parts. Fire acts on one such body, and pulverizes it: what happens then? The moisture, which held the parts together, evaporates. These parts, without the bonding lineament, are volatilized and change into dust or ash. Nature receives these various qualities, which, finding themselves in the same circumstances as before, regain the same form they once had, and which they had lost by the action of the fire.

The fire, limited in its volume, is restricted in its action: therefore, it must have acted on a certain number of bodies only.

The center of an Infinite Totality might be thought of as the highest point thereof. This Center, filled with the subtlest part of matter and unable to hold anything else, the parts in between density and lightness had to be content with the space closest to the center, and to fill the middle region. In each event of pressure caused by the fall of the solids, the bodies pressed back are set in the destination allotted to them by the eternal and invariable laws of their weight, in a straight line.

This falling of the bodies in a straight line from the center, that is, from the extremities of the columns terminating at the center, ended by forming a shell which was nearly round in its internal surface, but infinite in both thickness and form, in its opposite surface. We can easily consider a circle whose circumference is infinite on the exterior, and irregular, like this one; but regular and finite in its interior. There is no reason to suppose that it’s the substance itself that’s round, but rather the inside locality of the substance. While separating from the moisture and the fire, the dense bodies could only fall in a straight line towards the extremities. In this fall, since they repressed the lighter bodies, they must have forced downward those of like nature with which they had been joined, which they made heavier: which led to further pressure on the lighter bodies.

As the dense bodies made their way toward the extremities, the subtle bodies took over the center. These Dense Bodies, imbued with the moisture, where they had resided for so long, had formed Layers while being pressed against each other. Then this moisture, sealed up again between these various bodies, and finding no chance of renewal, was finally exhausted and became, at first silty, and finally compact. The subtler parts of this moisture would have continued to penetrate these heavy layers for a time; but in the end their action weakening their penetrative power, and finding no end to their course, ended up converting into the very thing they had entered.

Now, the enormous compactness of the immense heap of dense bodies could take no further penetration either by fire or by moisture, and so their masses had to fall wherever they had found a base: they procured this base for themselves, by this reciprocal support which the volumes lent each other by hooking together, and formed a crust surrounded by an immense multitude of irregular columns whose extremities, running from the center, have formed a circle or a similar shape, and whose opposite extremities reach to Infinity in a more or less regular or irregular manner.

Since the base of this crust is immense, it must be impenetrable: therefore, it is at rest. This base is also solid; so it doesn’t move. To attribute any motion to it is to posit the existence of matter beyond matter; that is, something beyond Infinity: which is absurd. If the great crust of nature moved at all, it would have to be surrounded by a fluid: there is no other way for bodies to move: only a chimera would spin in a vacuum; but a fluid in which the great crust would move, would also have to be contained by a solid. This fluid would not be like the universal substance, a Being possessing all hard and soft natures, dryness, liquids, etc. And if it had these qualities, it would soon lose them while penetrating the crust, at least in part. On the other hand, the superfluous liquidity which this fluid would gain by the purification, and the degradation which the great crust would receive from its penetrating action, would take from the world its durability. It would always have to start over, and it would have to be reconstructed to the same extent that it was destroyed. It cannot be ascertained, although it is highly probable, that the great crust is immense in its thickness, which might be such that the reunion of its external extremities, opposed to the center, could only be conceived if one could also form an idea representative of Infinity.

This great motionless crust became the base of motion, and one of the means which produced it, through its elasticity, which causes the bodies which are sent there to bounce back by the repulsive virtue of the igneous matter which occupies the center of the universal substance.

So far, we’ve only made matter acquire motion in a straight line; but it is not capable of this kind of motion only: it is also suited to circular motion.

The circular movement of matter is the clearest demonstration of the density of its shell. The fire, having reached the center of the Great Totality, took shape there as a Point: the pressure from the fire, then, on the nearby bodies, must have lasted until these bodies reached equal distances from its orb. First the bodies closest the fire were able to present their surfaces facing the center in an irregular form; but the fire’s action, devouring these irregularities, must soon have excluded them.

The compact matter which forms the great crust cannot have been the totality of all that was terrestrial and coarse in the universal substance. For the fire couldn’t have subsisted for a single moment within the moisture, properly speaking. This crust couldn’t, therefore, have been composed of the most terrestrial parts of substance. The fluid contained in the concavity of the great crust turns out to be limited: the base which it had acquired with its boundaries gave it a new strength and made it capable of supporting a weight. If our Waters weren’t contained inside the solids, they couldn't carry anything, because they would pour out on all sides, and their force comes from the depths of their beds and their solidity. This force, which certainly resides in the liquid contained inside the solids, has been the occasion for the formation of the various globes spread in what we call the world.

What remained of the terrestrial parts in the concavity of the matter, caused to tremble by the first portions of matter in their fall, was carried off by the undermining of these portions which served as their base. If they had more weight than they did, they would have occupied a place in the crust; but since they were in fact lighter, they couldn’t fall that far.

These parts of medium weight, imbued with the moisture in their surfaces, like the heavier ones, necessarily had to latch onto each other: as their volume grew with these new layers, they would have fallen towards the extremities of substance, if the surrounding fluid hadn’t itself been held up by the crust which contains everything. But, since these small masses were infinitely lighter than the volume of fluid which was between them and the internal surface of the great crust, they stayed put at various locations in the fluid, more or less close to the center, relative to their weight. Just as when you toss several different things in a basin full of Water, they will stay put at different heights, relative to weight and surface area.

The formation of the various globes depended only on the first base of each of these globes.

It’s on these first bases that all the particles presented themselves, and from which they were made. The Cavity of the substance contains a great number of these globes; it might have made an innumerable number of them; but the bases, being neither fine nor large enough in their surfaces, have broken under the burden: in this way globes have vanished, and from their debris others have emerged. It happened that the bases of some overly heavy mass have been broken, and that this mass, during its fall, was unable to find a base large enough to bear it, therefore it flew to the extremities of substance, adding thickness to the crust without leading to any diminution in the concavity, in light of the pressure it will have generated by falling.

Experience shows that fire has a repulsive effect on all surrounding bodies; yet, once the Sun (in common parlance) was made from the fire produced by the friction of the hard bodies, and enlarged by the particles which it had changed into its own nature, driving all the bodies surrounding its orb to the extremities of substance, and when these bodies met resistance in their trajectory, due to the force the fluid receives from the solidity of its Container, and colliding when they tended to go away in a straight line, they were driven into a circular motion, accompanied by that of rotation in all bodies which are endowed with it. Apply the repulsive motion to a fine body, cast into a fluid which is held in a solid base; you’ll see the object that was thrown assuming, first, a straight line, then a circular one, when it has touched the solid container, or when it has run into an object capable of stopping it.

Thus, a single particle, weakened and broken by the action of the moisture, could have produced straight movement in every dimension of material substance: the fall of any given object leads to that of all the objects whose base it was. Therefore fire, the effect of the shock and friction, inevitable in so many falls, became the Cause of circular motion while driving away the parts which came too close to its orb: which parts, finding resistance, either in the intermediary bodies, or in the volume of the fluid existing between the crust and them, or, finally, in the elastic surface of this same crust, were forced to move in a circular manner.

Just as there is no void in nature, by a law of weight, which cannot vary, the trace of the Bodies which are moved was quickly erased by an equal volume of fluid. Likewise, the volume of fluid around a globe is forced to follow its motion. Hence it occurs that the small globes which happen to exist near the larger ones have no motive force of their own; but they follow the movements of the large bodies and are carried along by the vortex which holds them in place. This is why the Moon, inferior in volume to the Earth, is carried by the vortex of the latter, and doesn’t have its own, strictly speaking; unless we want to use the term “the lunar vortex” to refer to the mass of fluid which sustains the Moon and maintains the gap between it and the Earth.

All natural movements follow either a straight line or a circle, or both. There are, therefore, only these two sorts of movement in nature. But we have just seen that Matter was able to acquire these two movements, or rather these two modes of a single movement by an accident, which must necessarily occur in its substance. It therefore has had no need for a Being superior to matter to give them to it. The intervention of a divinity to move matter is, therefore, useless. Besides, the definition of motion is repugnant to the divine origin which it’s meant to have. How could we ever conceive that the successive application of bodies to each other was the workmanship of a Spiritual Being?

## 4th CHAPTER: HOW THE FORMS COULD HAVE BEEN PRODUCED

The closest Globes to the Center of the Substance must have been the first ones on which forms appeared. Not that fire is able to produce any form; it would soon consume them again; but, at a certain distance it vivifies, in concert with the moisture, which putrefies.

What occurred in one Globe must happen in all the rest, sooner or later, according to their proximity or distance from the Sun. And so I will only discuss one of them. The Earth will be the subject of my reflections.

I don’t think it can be maintained that every globe is inhabited; for the principle is that the Sun vivifies the seeds. And, in the immense concavity of substance, some Globes must be infinitely distant from the Sun. Now, I won’t say that these Bodies were utterly deprived of forms: but they aren’t populated, the life of these forms must be different from anything we know of and which is active; and it must consist only in a kind of vegetation. If we compare our degree of activity with that of the inhabitants of a pole, we will see the difference made by the influence of the Sun on forms, relative to their distance. Let’s suppose that this difference is of one degree of activity: the animated forms on a globe which is a million times further away than our Earth is from the Sun, is in a state of numbness, and the animals of this globe might be like our trees, their trees like our stones, etc., as relates to how active they are.

In a totality such as the universal Substance there existed, not perfect forms, but pieces which were suited to produce an infinite diversity of forms. The laws of weight and the property of Extension must necessarily gather and unite a great number of particles of diverse natures, after the formation of the globes, and make distinct globes of them; some composed of homogeneous natures, others heterogeneous. The first became Beings, the second had to perish, at least with respect to their forms.

When these globules or forms were formed of particles of diverse natures, between which there was neither any clear homogeneity nor absolute and exclusive heterogeneity, these globules were able to preserve their forms; and perhaps such modifications of matter are what produced the mixed Beings, with multiple natures.

I don’t share the opinion of those who claim that nature produced only a single form, a single egg, from which, after the first Being slipped out, a second then emanated from it, followed by a third, etc. The proof they give for this is that we see no animal whose type, or generic similarities, are not found in another. Bend the fingers of a man’s hand into a certain position, they say, fill the gaps which would exist if you let his fingernails grow, and you’ll recognize the hoof of a horse. I grant that there is in fact a kind of type there; but what similarity is there between a stork’s bill and a horse’s mouth: what an infinite number of generations between elephants and mites! In this hypothesis, given the lapse of time required for these generations, there might well be completely new species by comparison with the antiquity of the generic genus. And the newness of some species is repugnant to experience. I prefer to believe that matter was able to produce distinctly all the forms of the Beings that inhabit the universe.

Everything has life in nature, after it is purged of its sediment, by way of purification. These crude parts which comprise the crust were, in substance, what the feces of grains are by their fall: they have freed the seeds, as the feces by theirs leave the grains uncovered.

With the exception of the immense crust which surrounds the world, everything has life; for everything has movement: and movement is the essential property of Life. I wouldn’t dare to claim that all that has life has feeling, for we know of plants and minerals which have life and don’t manifest any feeling. But that is impenetrable, and it seems to me that it would be useless to pursue this examination.

I will be content then to posit that all the parts which move in any way have life in themselves: not active, but passive. That’s to say that, not yet being complete forms, they don’t have its faculties; but that they can acquire them by means of union and completion.

The terrestrial globe, at the moment of its formation, didn’t look at all like what we see today, formed by a great number of layers of mixed matter, possessing both fluidity and solidity, its qualities must also contain something of mixed natures. We can, therefore, think of them as a silty mass, and consequently soft, although infinitely finer than the ambient fluid. Since the Earth is only a heap of layers piled on top of each other, as experiments have shown, while these diverse layers were accumulating, they must have encased a large amount of ambient fluid between them, in addition to a certain quantity of fire which was obstructed in its journey toward the center while the layers were falling, relative to their surface area. In the parts of the terrestrial mass containing much more moisture than fire, the latter overpowered and extinguished it, and acted on the parts which were nearby, undermining them, gnawing at them, and making a bed for itself. In the places where fire is found above the moisture, it has excluded it, turning everything nearby into its own nature with its devouring action; in this way, it increased its volume and enlarged the capacity it occupied.

It seems quite likely that, by their action, the moisture and the fire opened all the cavities in our globe; and, by the swelling of their overgrown volume, caused all the ruptures it has suffered.

These ruptures were necessary; therefore, they must infallibly have occurred. Their principle resides in the way the globe was formed. As soon as the globe was broken in various places by the action of the water and the fire, the latter rose, in its lightness, above the Earth; the water, in its weight, kept attached to it; the lowest parts were occupied by it; and it was by means of such drainage, these breakages in the terrestrial globe, that it ceased to be a heap of clay incapable of producing, or at least of manifesting forms.

There was probably a considerable lapse of time before the separation of the Waters from the Earth took place. During this interval the earth, penetrated in all its layers by the water which circulated there, seeking a passage, must have produced a great number of forms by its action. Here it deposited particles suited to the composition of the forms; there it transformed terrestrial partis and gave them new qualities. While the first forms were produced by way of purification, putrefaction and the heating or fermentation of the parts, the surface of the globe attained a certain degree of dryness, by the flowing of the moisture, part of which was absorbed by the Sun, and the rest was fell into the various cuts and depths of the globe.

In the instant of the retreat of the Waters, forms began to exist, properly speaking. These forms being indifferent to being this or that, could not perish, whether they remained on the surface of the globe, dry, or were brought into the beds of the Waters, or remained in the womb of the Earth. The same accidents which destroyed them when they were complete, couldn’t ruin them in their first state.

These First Forms were only impassive molecules, different from non-Being in that they could become Being, and different from Being in their simplicity. For Being means the same thing as an object made up of diverse qualities. The action of the Sun on the surface of the Earth attracted these molecules in varying degrees relative to their weight. It took some things from the Water and also from the vapors; and this volume of the moisture and of terrestrial parts, becoming either too heavy to come close enough to be devoured by it, or being too slimy, was driven back towards our globe by the repellent action of the fire.

Through these various attractions and repulsions, the forms acquired new qualities, and were fertilized by the moisture and the heat which was deposited there. Thus, by the preparation we give to certain portions of brute matter, and with the assistance of fire and Water, we bring them fertility, which is a sign of Life. If we don’t posit sensation in these parts of matter, it’s only because we’re ignorant of the harmonic arrangement which produces it; because we lack the true fire, pure water, as it was at the origin of all Beings, and of the earth when it was first separated from the universal substance; ultimately, it’s because we don’t know all the mixed natures and qualities which enter into the composition of a Being endowed with feeling; and because, even if we did know these mixed natures, we couldn’t use them; for we could [never] attain them: they are beyond our reach.

We manage, with the help of art, to give forms to matter; we bring many of its parts to a state of putrefaction, and bring them to life, to a state suitable for reproduction. In these operations, we don’t need the intervention of any Agent foreign to matter: likewise; matter was able to form, putrefy, and vivify its own parts, without the assistance of any external agent. This comparative argument only shows that matter must have accomplished these operations in a way far superior to ours. As blind as it is, as it acts by necessity; without choice, but following the eternal laws of weight and homogeneity of bodies, all its productions are measured: parity unites diverse but not contrary natures; disparity divides them if it is repugnant: and Beings are composed of diverse but not contrary natures or qualities. The simple forms already exist: on this principle we will soon see Beings appear.

## 5th CHAPTER: THE FORMS UNITE, AND PRODUCE BEINGS

The Earth is the womb, Water is the seed, and fire is the vivifying and productive Principle. There is only one substance, one Element: what we call air is only an accident of substance; a mixed nature composed of terrestrial, igneous, and viscous particles. The heaviest Particles of fire, the lightest ones of Earth, and the most rarified of moisture, together form what is called air. The space it occupies proves this is true.

The material substance contains every quality in itself: qualities always accompany Essences, as long as they remain in their natural state. But material substance is extended everywhere: therefore, there are qualities everywhere. The qualities are diverse in the diverse modifications of matter: Elasticity is suited to dense bodies, flexibility to soft bodies, heat to igneous corpuscles, movement to Liquids.

The forms which were produced originally, although they were indifferent to the form they took, were unable to unite with the opposite forms, which contained qualities absolutely contrary to theirs, and which excluded them: such a union, assuming it were even possible, couldn’t have lasted long. If those bodies which were infinitely hard united with infinitely soft bodies, they would have made the latter lose their forms. When a hard stone hits a portion of soft matter violently, the latter completely loses its form and becomes an envelope for the former.

These unions of opposite forms, or rather the action of the hard forms on the soft, and the envelopes which the former have made of the latter, has given Existence to voluminous and immobile masses, which can do nothing but grow, and are completely passive: these are the Stones of various natures, pebbles, marbles, etc. Such bodies must exist, from the very moment of the development of the universal substance, and perhaps in a quantity equal to that which is today, because the weight of the mass has been, and always will be eternally the same.

It would be acting contrary to experience to refuse a sort of life to stones: their growth implies movement; and movement is the essential characteristic of life. This life, although passive, is still life: we also know how a portion of matter deprived of motion can acquire it, and, from the size of a lentil bean, grow to become a very powerful mass. Nature proceeds in this operation by the path of filtration, initially. The moisture which attaches to the particle of earth which is dried out by the action of the central fire or of the Sun, hardens the surfaces. A new moisture returns to soften the surfaces of this particle. If this moisture is too considerable, it dissolves the particle: this will be annihilated as to its form; if it’s only of medium quantity, it makes the small mass swell and, by penetrating it to a certain depth, increases the volume of all the tiny parts which it deposits in its pores while penetrating it. I can already consider my small particle as a clump, and the progression of all plants and minerals, which happens under my eyes continually, teaches me that this part of the earth which today is only a nearly imperceptible point will be an enormous boulder after a certain number of centuries.

The miracle of passive life, given to certain bodies by the universal substance, is as great as that of the active life which certain other Bodies enjoy. It’s always according to the circumstances in which the forms find themselves, and the degrees of parity and disparity which are found in the unions between these forms, that they produce active or passive Beings, men or trees, trees or Stones. It would, therefore, be enough to prove that the universal substance has the power to engender Stones or trees, which is confirmed by experience, to realize that all Beings are the result of the various operations of matter. Nevertheless, I will offer my conjectures on matter, whose first forms have passed from a state of rest to motion, – sensation, and thought, being produced in them by a substance which is both different and distinct from matter, called a Soul.

The weight of the forms which compose immobile masses is the precise reason for their immobility. With less earth and more fire, stones would not stay put. With more fire, our globe would always be in motion. When too much fire is amassed in a portion of this globe, this part of it moves. The quaking of Earth is a jumbled symbol for the perpetual movement in which our individuals find themselves. Those whose limbs tremble early are those with the most fire in their organism.

Thus, the quantity of fire in the forms has determined their fixity or mobility without the need for any other agent,

The forms with a hard nature, having, by their union, driven out a large quantity of fire which had resided between them, and preserved a considerable volume of moisture, could only form very heavy masses, which were consequently unable to rise above the Earth’s surface. The forms with a soft nature, on the other hand, whether they contain particles of fire, or receive the same action from the Sun, must have acquired every more lightness by the drying caused by this fire. Their weight, however, attached them to the Earth; and this placement caused growth in them, produced by the particles which the moisture continually deposited in their pores while passing over their surfaces.

Once a certain consistency was achieved, and a size relative to the volume of any Being, by the necessary union between the parts whose surfaces participated of both soft and hard natures, perpetually moved by the motion resulting from the action of the fire and that of the Water, then Beings appeared. Being is a mixture of moisture, the dryness, and fire, whose equilibrium is maintained by its opposite, moisture.

The more earth, which is the basis of all existence, there is in a Being, the more its weight attaches it to the ground; with more fire it rises up; the union of these qualities in due proportion gives it the faculty of separating from the earth for a certain amount of time.

A rooster and a hen produce an egg from which heat then makes a chick emerge; but the universal substance, of which this rooster and hen are only modes, had in itself the germ, the yellow and the white of all the eggs of all possible Beings.

The same thing happens to each Being as what happened to the great totality. Once the forms were united by motion, the fire they had contained, through union, changed into its own nature the parts closest to its orb, and pushed to the extremities of the mass the coarser parts. This sort of wall, by limiting the action of the fire, augmented it. Fire is a quality which is irritated by obstacles that it can’t destroy. Finally, the fire contained in a mass, ever seeking to rise and unite with its principle, which is only its greater volume, and being forever kept in its shackles by the moisture, couldn’t elevate the body where it was contained in the air, but it had enough force to set itself upon its columns, that is, on its feet.

The formation of Beings may, perhaps, have lasted a great number of centuries. The Polar Regions must have been the last to be populated, given their near-absolute deprivation of fire; for the putrefaction brought by water to the various tiny portions of matter isn’t sufficient to make them pass to Existence: the regenerating action of the fire is also requisite.

Look closely at a frozen animal: you won’t perceive any Symptoms of life, although it is truly alive. Then apply fire to this animal: the action of the fire, applied externally, awakens the fire resident in the center of the animal, procuring an explosion throughout the individual. The efforts made by the central fire to unite with the analogous quality of the external fire shakes the individual, make it tremble all over. This is how fire animates bodies. If the fire applied to the animal were too large, it would draw out all the individual’s fire: the animal, deprived of the only thing that gives it its energy, would stay attached to the Earth without being able to leave it; but, since the external fire only awakens the central fire, the animal moves. The influence of the Sun’s fire on the fire contained in individuals; the efforts of the latter to join with the former, and its inability to do so as long as it’s restrained by the crust, which possesses both solidity and moisture, which surround the individual, is what make all bodies move. These opposing actions put it in a middle State. And we have to agree that things couldn’t be otherwise, when we realize that homogenous qualities constantly seek to join together. So, an individual is attached to the Earth because it has a terrestrial part, and because it has a fiery part it rises up: all in proportion to weight and volume.

If the moisture had remained eternally mixed with the Earth, no active Being would have ever been produced. There would be everywhere the same lack of rarefaction, without which breathing, which is one of the conditions of active Life, couldn’t occur.

But if the surface of the Earth had remained in this soft state where it had to allow the retreat of the Waters in their beds, the Earth would never have ceased to produce new Beings. The species are quite diverse. They would have been infinitely more so. For what variety shouldn’t be expected from a blind, necessary Cause, which is only determined in its productions by the weights of whatever it touches?

We can’t be sure that the Waters don’t incessantly produce new generations and species. We are ignorant of the shape of a huge number of their inhabitants; and when we discover any with some analogy with the ones we know, this near-resemblance leads us to mistake them for these, no matter how different they may be in other respects. Both the ancient history of the productions of the sea and the new one tend to convince us that the sea does in fact continue to produce new Beings. But we can’t be too sure on this point.

As for the Earth, it must have produced Beings until it was completely dried out, which certainly took many centuries. It seems quite likely that Beings of great volume and a more numerous organization were the first to be formed: as the spermatic clay lost its quality by drying out, the Beings it produces have necessarily been smaller: for the more strength a seed has, the more power it has on the surrounding parts to convert them into its own nature.

To the extent that moisture disappeared on Earth, fire found greater ease in evaporating, and escaping from it. The little that remained could give the later Beings only a very meager degree of activity. All species of Reptiles are, to be sure, such productions.

After the Earth was fully dried, the action of the fire from above killed off all the remainder of the seeds, the forms, on its surface. But, as this action couldn’t reach into the entrails of the Earth, a great number of seeds were preserved there, which only needed to be impacted by fire to come to life. When we open the earth to a certain depth, the layers we expose to the Sun give Being to an infinity of species of plants, etc. It may be that, if we could restore to the Earth’s surfaces the silty quality which the globe had in the epoch of the formation of Beings, we might well see the appearance of a new world of different species. When we divert Waters onto plots of land, after a very long time, a great number of aquatic and amphibious animals appear. If we could know the degrees of *imbibition*, we might witness the production of various species of men, Dogs, horses, etc. It costs nature no more to produce a Frog than an Elephant: but matter has to be put into combinations or it will never produce its various effects.

We find in the cavities of mines, in the heart of the stones, a great number of forms which are more or less close to the configuration of certain Beings that we are familiar with. What an immense multitude of forms are in the dregs of coffee when poured out into a pot with a large surface area! That’s a good, albeit small, likeness of the Earth’s surface, after the withdrawal of the superfluous moisture. In this alone, what an infinite variety! How many different species! Within the genus we call human, I’m convinced there are millions of species. The author of Genesis was unaware that there are blacks, Chinese, Laplanders, men who are greenish, yellow, pale; men with two feet, others with one; some with tails, some without; men with horns, men covered in hair, men without horns, and hairless ones. He was unaware that, without an accident, white men could never give existence to black ones, whose blackness is caused by a bluish tissue, originating in the epiderm and extending throughout their body: a tissue which is not found in us. Consider how many species are contained in the genus of dog: why shouldn’t there be at least as many species of humans?

Productions happen relative to climates: and for the same reason, we’ve found new genera in the climes so far discovered; we can be sure that those we don’t yet know of also contain many, of which we have not the least idea.

Just as we have found that the genus of Horse is completely unknown in certain countries, it is also likely that there are others where the human genus wasn’t produced; and I’ve already pointed out that if the polar extremities of the globe are indeed furnished with animals, these animals must be perpetually numb; since there is too much earth and too little fire in their being for them to be endowed with activity.

## 6th CHAPTER: HOW BEINGS ACQUIRE FEELING

Flexibility is the precondition for sensation. Hence, we can conclude that it is unavailable to those Beings whose surfaces are infinitely hard. Sensation is born by way of impressions: and impression seems impossible in bodies whose nature is compactness: thus Stones, etc. have no sensations. Moreover, there’s no point wondering whether Stones, trees, etc. have any feelings, since their fixedness doesn’t let them manifest them.

We therefore only consider sentiment in Beings endowed with active life, since these are the only ones that can manifest it, and since it’s essential that we only act according to experience. Experience, it is true, doesn’t assure us that things happen just as we conceive them; but it does at least guarantee that they happen by similar, or nearly similar means. And we must be content with this nearly-so, until we reach greater certainty.

The first Beings in nature were the only ones that could have witnessed how it happened: they might have witnessed, during many centuries, the development of the various Beings who came after them. But what can one expect from Crude Beings, still smeared with the clay from which they emerged? I fully expect that the human species, like others, has not always been as it now is: in the first inhabitants of the world, matter was too robust, the moisture must have been too dominant in it for the fire to have much effect. The first humans didn’t have any more thoughts than oysters do. Their genius must not have extended much beyond their needs; and they had few of these. Hunger is perhaps the only and the first one they felt. And it didn’t take much wit to satisfy this need. Once man had left the earth, his womb, he must have been gripped by hunger: but he only had to bend over towards his mother to satisfy this need; hence we can conjecture that the first men had few ideas.

I would even venture to say that the first humans had few sensations. That which we call sensations or sensibility implies an alteration in the nature which is endowed therewith. Past discoveries of savages with far less sensations than us confirm this conjecture. Ideas are made by impressions; impressions get their strength or weakness from the robustness of the Individual who receives them; therefore, the first humans could only have few ideas, and little by way of *sentiment*.

Those contacts which make such deep impressions on a child, make only light ones on an adult, while they produce no sensations in bears. Man, upon leaving the Earth’s clay, and the surface of this robust individual having been dried by the Sun, against which he may have had no shelter, might well have resembled a bear. The succeeding generations must not have had the same robustness: although the second germs were composed of the same particles as the first one, the savor of these particles must have been inferior, since its virtue was divided between the producing and the produced animals. Besides, how different, in a closed womb, like that of a woman, are the fluids it can bring to the seed introduced there, and the earth newly separated from the Waters, full of succulent qualities.

Those humans who were born from the first couplings must, therefore, have been more delicate, more sensitive, less robust, than those which the Earth had produced; subject to more impressions, and consequently to more sensations, and more ideas. But how many centuries must it have taken to lead humans to the degree of sensibility they now possess?

What has done most to obscure the question, i.e., how matter was able to acquire movement and sensation, is the way we usually consider these two resultant qualities as things with their own, real existence; as Entities; while in fact they are only modifications, ways of being of the universal substance.

Sensation, far from being a self-existent, is only an effect of things which themselves have no sensation. It will be easily agreed that the white, yellow, and the seed of an egg have no sensation; and yet I can open an egg laid only three days ago and witness the beating heart of the chick. But this beating heart has feelings: therefore, sensations are produced by causes which don’t have any themselves. Therefore, sentiment is nothing other than the action which results from a tissue of fibers, membranes, and vessels which have interrelations and correspondence with each other: Therefore, it’s all the properties of the firmest, supplest parts, and the interrelations of these parts, that produce sensation. When Descartes concluded that matter could not produce sensation in the Beings it modified, because he could perceive no sensations in the particles of matter, he was acting just like someone who, looking at the separate pieces of a windmill, would claim that stone and wood can never acquire the quality of grinding grain: indeed, none of these pieces alone can grind; but when united they acquire new qualities and are enabled to crush and pulverize grain. The result of which is that effects like motion and feelings come only from the linkage and correspondence, and the unanimous action of the combined parts of Beings.

A new proof that sensation results from animals’ organization can be found in the diversity of sensibility among the individuals of a single given species. The hardness or flexibility of the organs produces the scope of their sensations; for impressions are made relative to these qualities; and feeling is produced in Beings in proportion to said impressions. No impressions, no feelings. Therefore, the first humans must have had few of these. For what impressions could such robust bodies receive? Those of heat, cold, hunger, thirst, lust: the feelings of the first men probably didn’t exceed these limits. Later, they were increased relative to the needs coming from their nature and their imagination, for we have these two kinds of needs.

I think of a primal Being as a heap, a lump of material parts, with either a round shape or some other one. From this perspective, I easily conceive how the Sun’s action on one hand, and that of the fire contained inside this heap on the other, can set the mass in motion, by their repulsive and attractive powers. I also easily conceive how this fire, both internal and external, as the blind effects of a blind cause, can change the form of this mass. The fire from the center, seeking exhalation, explodes from the center to the Surface; it finds this surface dried out, hardened and impenetrable, and its efforts end by extinguishing, in various ways, the material particles it has driven ahead of itself. These various extensions, always equally limited by the external head, formed the arms, the legs, and the head, of all Beings. Sensation is then formed in each part of these Beings, relative to the hardness or flexibility of their component material parts. The nose, in the composition of which came only soft, spongy, and flexible parts, receives, in well-formed people, impressions with greater vivacity: it has no need to be warned of the presence of those objects which make an impression on it. Our feet and hands have no sensations, if they don’t touch those bodies which give them feelings.

General and particular feelings are therefore only produced in Beings relative to the qualities of the particles which enter into the composition of these Beings. If things were otherwise, all Beings, or at least each kind of Beings would have the same degree of feeling: which is contradicted by experience; for in the human genus, among others, you may find no more than two individuals who feel the same way about the same object. This dissimilarity in the feelings of Beings originates in the dissimilarity of the forms which entered into their composition. A cause like the universal Substance: blind, acting necessarily, and always relative to the weights of materials, could never produce anything in duplicate. Thus, we see no parity, either in Beings or their modifications, but many relations. These relations are noticeable in Individuals of the same genus; they are also found between genera; but here they’re feebler, and ultimately unnoticeable. Still, these relations between genera have led some Philosophers to think that the universal substance only produced one prototypal being from all the varied Beings in which it was modified across so many ages. But these relations, accompanied by various degrees of sensation, prove that sensation is only a quality, a resultant of matter, modified in an infinity of forms with varying degrees of hardness or softness.

Let’s follow the animate Being in its various ages. This contemplation will give us a fully convincing proof of the materiality of sensation. Everything makes an impression on newborns: when this same Being reaches decrepitude, it has hardly any sensations left, because it hardly has any Contact with surrounding objects. When the impressions go, so goes feeling. The flexibility of the individual’s surfaces ceases, when, gradually, the internal fire has consumed the greater part of the radical humid: it forms a crust on the extremities of the sensitive organs, which throw up an invincible obstacle to the action of the external Causes. What a great difference there is between the way a man feels at the age of twenty and eighty! If the same woman is presented to him; or even if new, ravishingly beautiful strangers are shown to him, none of them will have any effect on him. The external surfaces of his sensitive organs have become sclerotic. This experience leads us to examine how feeling of sexual desire is produced in Beings of either sex.

The animal, made of countless material particles of different qualities, necessarily contains their varying weights: as the masterpiece of a blind architect, geometrical precision was forbidden here. Hence, those in which the moisture was dominant only had weak feelings of lust. On the other hand, man, or any other animal in whom fire had the upper hand, being constantly agitated by this fire, will necessarily have been quite promiscuous. The new particles of igneous substance which it inhaled, in conjunction with the volume of fire it already contained, must have joined to form quite a strong mass and dried out much of its moist part. Finally, the overabundance of internal fire must have degraded the being; the degradation of a Being is like the womb and the productive cause of the means to remedy this degradation. It’s by friction, especially, that fire is forced out of bodies that contain it. From then on, the male animal sought an object to procure such friction for it. He only needed his eyes to discover, in the opposite sex, respite from the evil that plagued him. For her part, the female felt the same discomfort from the overabundance of the moisture as the male from his superfluous fire. He needed something to dry him out: the conformity of their parts indicated their purpose. This was all they needed. In this hypothesis, based on the experience of what occurs among us, we can conclude that millions of Beings from the first formation have perished without reproducing. Those who belong to this category certainly didn’t feel sexual desire. But this absence was due to their material constitution: therefore sensibility, considered either generically or particularly, is a result of organization of a being: therefore, matter, i.e., the modification of matter, is its Cause: therefore, it is only material; an effect cannot differ in essence from its Cause.

From what we have just said, another question arises: that is, how said reproduction occurred. There is no doubt that the First males and females were led to reproduce in the same way as they were led to eat food, etc.: i.e., through necessity; not that they knew that such actions would Reproduce them: this Knowledge was the fruit of experience. They initially groped their way along, and chose the path most pleasant for the male, and least repugnant for the female, without knowing where it would lead, nor what would come of it. Thus, the question doesn’t pivot on convention, but only on the fabrication of the seeds in individuals.

Without the fire’s action, all the forms would have remained on the Earth, or inside it. The fire’s action constantly attracts the seeds, ripens them, and drives them out; by its power of attraction it deprives the earth of them, by its power of expulsion it sends them back. Animals, which can’t live for a moment without being moved by aspiration, receive a great number of these forms in every interval of their lives. These forms, as we’ve mentioned, have motion, that is, passive life, with the potential to become real and active life. Millions upon millions of these perish at every moment in every yard and foot of the globe. Those which enter individuals will assume various modes there: some, which have a lot of moisture, produce fluids like blood, the humors, etc. They increase the mass of these qualities, from their own substance, and that of the subjects they convert, by their action, into a similar nature.

Others, in whose organization fire predominates over moisture, will add to the volume of the fire in the animal, increasing it to the point that it would perish unless the moisture offered resistance. If they find themselves equal with respect to their nature, they animate the Being, but don’t give it the power to reproduce itself. For this faculty to reside in a Being, the fire must overpower the moisture: then this quality, having given to the animal everything necessary for its maintenance, sets aside its surplus in storage. When the storehouse is full, it must be emptied, by any possible means. This voiding itself isn’t, as many have thought, of the purest, as its weight proves, but rather of the warmest part of the matter, which leads to reproduction. The plants don’t always need to copulate to reproduce; this is because they hold to the ground, and in its bosom they drop the spermatic grains they produce. The active Being, the animal detached from the Earth, doesn’t get food automatically, but only what it produces; which is far different; for, just as certain portions of matter acquire virtue, others lose theirs when they’re modified. Man, detached from the Earth as he is, lacks the analogy with it which Plants have: he therefore needs a different womb than the Earth to plant his seed in: an artificial womb, of a different quality, but analogous with respect to its substantial quality.

The way this seed is formed requires nothing beyond the powers of nature. Everything that the animal eats and breathes is some part of the qualities of the universal substance. A good proof that the formation of the seed is only an accident of matter, is that we can increase or decrease the volume of this seed in individuals at will. A male who is fed with cold, narcotic things such as water lilies, won’t be able to reproduce, while the opposite kind of food such as Truffles make him very fertile. Thus, the formation of seed in the sexes depends on the properties of their food. The principle of all things is in the universal substance: food is in this principle as well as in their womb, they are part of it. And so it’s not shocking to find that the manducation of food provides Individuals not only with the wherewithal to keep them alive; but also a surplus for the purpose of reproduction.

## 7th CHAPTER: IDEAS

Most of the Philosophers, with the exception of Descartes, have granted both motion and Sensation to all animals, without distinction: but they still find it repugnant to grant that they have Ideas. It’s always the same illusion that keeps us from reaching the truth. Since ideas have no bodies, the conclusion is drawn that they’re spiritual. Now and always, effects are confused with Causes.

Ideas are occasioned in us by the impressions we receive. An animal which receives no impression, would have no ideas. This is why Children have so few of them. If our bodily parts were made of a kind of matter which was as flexible as our brain, then we’d have ideas in them too. We have three kinds of Ideas; true, artificial, and false.

Ideas represent objects which are either present or absent to us; here I’m speaking of the true ones. These ideas are nothing other than the effect or the sensation produced in us by contact with a given body, with one of our organs. We must have seen, felt, touched, tasted, or heard an object to have an idea of it. The cause of the idea is, therefore, material: but the effect is not essentially superior to the Cause which produces it: therefore, the idea is material. It could even be said that ideas occupy particular locations: as proof of this, consider forgetting, which is only the action of one idea on another, an act of destruction.

Recollection is formed in us by analogies in the impressions. Upon hearing one verse from Virgil, fifty others come to mind.

Americans had no idea of horses before they first saw them: we had no idea of hummingbirds before the New World was discovered. These causes of the ideas of horses and hummingbirds are material; therefore, the same goes for the effect produced by these causes.

Artificial ideas are no more spiritual than true ones. I have a distinct notion of the head of a rhinoceros and of the body of an Elephant. I join these two forms together and I consider them as united in a single Being. This is what all the efforts of my mind come down to. The causes of this idea are material: it is stimulated in me by physical objects: therefore, it is of the same kind as the subjects which produced it in me.

False ideas can’t be so easily explained: they don’t originate in bodies which exist in nature. But their name works against them, and if I stop to consider them, they’ll vanish. I think of a squared Circle; the words which express this idea are no more repugnant than those of a right angle, etc. But when I want to judge the representation or the image that this idea excites in me, I sense that it’s false, and that it contains a contradiction with the essential properties of circles, which exclude those of squares: and I can’t trace one of these shapes without excluding the other, when I consider it as a single thing. The ideas of cold heat, of dry humidity, of solid fluid, are of the same sort; and it wouldn’t be hard to add to the same category the idea which many nations have of God, or the First Cause, which is all-good, but does evil things; or omnipotent, but who doesn’t prevent evil.

Experience convinces us that we only get ideas occasionally. Someone who spends his whole life shut up away from other Beings would have no ideas other than those of hunger, thirst, sleep, pleasure, and pain; he would also have to have experienced these accidents. Someone who has never endured an amputation can have no idea of the pains it causes.

A State Minister has ideas of the police and government which a farmer doesn’t have; but, on the other hand, the latter will be better than the minister at judging the virtues of any plough. If I were to lead both a capable general and a farmer into a field without telling them why: the first might decide that this field would be advantageous to give or receive battle; the second that it could grow excellent wheat; and this without deep thought processes, but only by instinct. Don’t even worry about the General getting any idea of the productive qualities of the soil which I offer to his sight: his first reflection relates to the position, the locality. Its position has no influence, or only secondarily so, on the Farmer’s instinct: he’s guided by the quality of the soil.

I’m entirely convinced that a monarch has no truer an idea of practical obedience than a Wolf has of civil society and its obligations.

The stubbornness of some about opinions which are geometrically false, is proof that ideas are accidents in which matter is modified, and that they are the result of impressions. We can neither stimulate impressions in ourselves, nor prevent their effects. Thus, we often have unpleasant ideas which move us disagreeably, not only during sleep, but also while awake.

Ideas, no less than the sensations of all animals, are only the result of our organization. The more perfect this organization, the closer the ideas come to perfection. By its fortuitous concurrence, a blind substance like matter couldn’t produce completely identical Beings: hence this diversity we see between the ideas of all Individuals.

The contemplation of the causes which produce ideas in us forces us, despite all our prejudices, to attribute its origin to matter. When a sonorous body, such as a bell, is struck, it produces the idea of sound in me. No sound has ever been seen; and the idea which is formed of it seems completely spiritual; but experience soon puts an end to this prejudice. Between my ear and the body that makes the sound, I place some opaque bodies, solid in proportion to the volume of the sonorous body. By the Interposition of these solids, I weaken and finally I eliminate the sound with respect to myself, even though the sonorous body continues to produce it. If the sound were not a result, a material effect, then placing solid objects would do nothing to oppose its ingress into my ears.

If we had no senses, we would have no ideas. Those born blind have no true ideas about colors: our senses can only be affected by material agents: therefore ideas, as results of the impressions of material agents, are material, like the causes which produce them: otherwise the effects would be Superior to their Causes, and wouldn’t possess the same nature, which is contradictory.

Moreover, for matter, modified into this or that arrangement, to produce movement, feelings, ideas, thought, is no more miraculous than is the property of fire which burns when approached too closely. We cannot give precise definitions of any of matter’s properties. But, given our ignorance about how it proceeds, we cannot conclude that a substance distinct from it carries out its operations. An Indian, ignorant of the art of clockmaking, concludes when he sees a Pendulum that either Spirits or animals were inside this time-measuring machine. How many people draw conclusions just like this Indian! Wouldn’t it be absurd to maintain that a bar of metal can’t become a clock, a machine which moves itself for a certain length of time? But this is how the enemies of matter speak, after examining any of its portions which are deprived of manifest properties: that, in general, it is incapable of acquiring any.

## 8th CHAPTER: ON THE LIFE AND DEATH OF BEINGS

These two accidents, which so profoundly affect Individuals, are one and the same thing with respect to substance. It’s in the weights, and not in the forms, that the existence and eternity of the existence of matter consist. The reciprocal relation between these two accidents comprises a dogma of the Philosophy of the skeptics. The Christian sect and many others have thought they found much dissimilarity there; but they never sought their principles in Physics.

Man, whose composition includes diverse qualities, could not, for that very reason, be a first principle of action: therefore, he could never be eternal. Nothing is eternal but Substance. Mobile and pliable in all directions, nothing can ruin it. It loses its outward forms, along with the qualities attached to these forms; but its nature receives no harm from this.

Prejudices, originating in the furthest antiquity, have led us to see death as the worst thing that can happen to an animal: nevertheless, it is nothing, or nearly nothing; when it comes suddenly, it causes no upset, no unpleasant feeling in the animal who suffers it. It doesn’t even cause it the slightest pain. The incidental circumstances accompanying things do nothing to change the nature of these things. And death, stripped of certain circumstances, arouses no unpleasant sensations in us; we can only judge things based on the impressions they make on us: therefore, death is not an evil. There is no evil but pain. And death can even be a good when its arrival puts an end to the pain that racks us.

If death were an evil, then life, its opposite, would be a good: which is experientially false.

Generally speaking, animals are only born to maintain, by death, the chain of living Beings. It would be repugnant for life, considered as a good, to have for its precondition death, regarded as an evil.

Death is grafted onto individuals in the same way as life seizes them, that is to say, gradually. They are two modes of substance, which don’t change its essence. Life is a union of parts from which active motion, sensation, etc., results. Death is the disunion of these same parts which thereby lose feeling, etc., which had this union as its precondition. The material particles which are the basis of individuals, are insensitive and inalterable; when fire, moisture, which are part of these same individuals, have evaporated, the particles which the moisture united and which the fire moved are divided and return to a state of rest, until they find themselves in the same circumstances they were in when they first constituted the individual who had been decomposed. Then these same particles regain life and motion, and even thought, according to whether they re-enter Individuals suitable to be the subjects, or not, of these accidents.

Inclinations and other accidents are not preserved in the transmigration of the particles, since these accidents are not essential properties of these particles but the many results of their combinations.

A certain number of material Particles, combined in this or that way, produced in this monarch the Inclination which is called generosity: if we imagine these same particles transplanted into a Pig, they will produce, by the new combination they undergo there, the inclination called gluttony. However, when the Being is decomposed, neither do the Particles which formed it experience any sensations, pleasant or unpleasant, as a result of these changes of state; because the way the individual presently feels is always the result of the present arrangement of its parts. That which affects us in one age, doesn’t affect us in another; this is due to the changes in our parts, and the various combinations which our parts undergo. With all the more reason, when death leads a Being to total decomposition, the different states its parts pass through can have no feelings of the worst or the best of their present situation compared to the previous one.

If material Particles were observable, it would be a fascinating spectacle, and also of great consolation, to witness the decomposition of a Being who loses its form. Part of this Being would be seen rising to the sun and contributing its own brilliance to the lighting of the world. The fire in the individual is its lightest part: it’s also the first part to detach from it at death.

We would then see the moisture freed by the retreat of the fire, acting on terrestrial corpuscles, penetrating them, detaching them, putrefying them, changing a great number of them into its own nature; then pouring out, with no additional materials to work on. Surround a mass of Water, earth or Ash: the water soaks into these materials, divides them, penetrates them, and finally is poured out. It does the same thing at the death of Individuals.

Finally, we would see the earthy particles, fine and solid, uncoupling from each other; and the forms which their combinations produced, vanishing. Having rejoined the common soil; there they acquire new qualities through fermentation and digestion, and become the basis of plants and minerals, if these plants and minerals are taken up by the animals, these earthy particles can become sensitive, active, and even thinking again.

All the accidents of matter form a circle of mutual dependence. The life of an Individual always has as its precondition the death of one or many other Individuals in other kingdoms. If all animate Beings of an active principle, such as humans, wolves, etc. only lived on plants such as herbs, fruits, etc., the earth wouldn’t be big enough to sustain them; all the less as it would have been deprived, by the reduction [of the number] of its animals according to its mass, of a great number of fattening qualities that they contract by devouring the Individuals of their own realm.

Those who have supposed locations outside of nature, where Individuals would go upon leaving this world – a Paradise, a Hell – have not understood how repugnant this supposition is to the System of the Maintenance of the World. If our globe had been deprived of the great number of Beings who populate, as they say, Heaven and Hell, it would long since have run out of people. It’s because of their weight that a globe is what it is: this weight can’t change without upsetting the harmony, not only of the world which would suffer this alteration, but also that of all possible worlds, of which it is the counterweight.

Death, we conclude, is not an accident to be either feared or desired. It will be alleged, however, that all animals find it repellent. I respond that it’s not death itself that repels us, but the pain that so often accompanies it. We even desire it, and some people deal it to themselves when their pains infinitely outweigh their pleasures. Terror about the future is the motive that excites the fear of death in those who have accepted a religious system, and the dogmas of penalties and rewards. But we see that life overcomes modified substance in the same way as death; that these two modes are only union and disunion of Parts; that death only takes away the forms, without ruining the essences; that the Essences, whose union produces life, come from the universal substance; that this substance can lose nothing as to weight; that it is always the same. It is therefore absurd to suppose that the Parts which remain eternally in the heart of nature are punished or rewarded in the places outside this same nature, and of whose existence we have no proofs other than allegations of certain people, who for all certainty assure us that they have ideas about these places.

## 9th CHAPTER: CONCLUSION

= > From the principles we have established, and from the conclusions we have reasonably drawn, it’s easy to see the cause of the world within the world itself. A multitude of presupposed distinctions in things where they are absent, properties considered as substances, and results as principles, have spread a thick fog over a fact which was already obscure enough in itself. While pruning away these hypotheses, based on unknown principles, and which carry the seeds of their own destruction, we simplified the question. All of our proofs, it is true, aren’t mathematical; nor do we claim to indicate precisely how nature proceeds; but only that it does proceed, and more or less how it does so. And how could we determine the means used by substance to produce its effects, when we’re absolutely ignorant about what this Substance is; its nature is unknown to us. From the effect we might conclude as to the cause, if we weren’t stopped by experience, which convinces us that what we relate to objects isn’t there at all. Indeed, what we experience in the presence of objects: the impressions according to which we judge their qualities; what we experience, I repeat, in the presence of these objects, forms a feeling which is only in us who perceive them: what parity is there between the arrow which pierces me and the tree from which it came? The pain I feel makes me judge the wood as something evil: but when I lay down in the shade of the tree which produced this arrow, I judge that the wood is a good thing. This experience convinces me of my ignorance about substance; but it teaches me that the qualities which are good, bad, or in-between, are only the result of the various combinations of the substance.

Just as movement is an accident resulting from the weight of the bodies, we can know perfectly well how it is produced in substance and in its modes. The fact that the heavier masses don’t move leads us to conclude that lightness is a precondition for motion. We conceive how movement is maintained by our experience of the *repellent* action of fire on certain bodies, and its *attractive* one on certain others.

Here, experience abandons us; reason becomes our only guide. We see Beings pulverized, dissolving into imperceptible particles; we conclude that since this dissolution leads to death, union is what produced life. The infinite divisibility of matter leads us to consider it as *imperishable* as to Substance; and these particles, which cannot be annihilated, are considered as so many partial forms, complete forms, or Individuals.

We have just seen that the law of motion, an accident of weight which is a more or less generic property of all bodies, is not what stops us: but the origin of sensation, of thought is an enigma; we only glimpse it by a series and chain of conclusions, whose thread few can follow. The mere Thesis of the formation of Feeling would fill entire volumes; for we’d have to trace it through the immense chain of Beings which are endowed with it.

But to be brief; and in the desire to affirm nothing about this procedure of nature, we say, with respect to sentiment, that its diversity in Beings relative to their similarities, proves that it’s an accident of matter. For example: all the soft and moist parts of animals have some degree of sensation, while their dense parts have little or none: but these soft and hard parts are both equally material: therefore, feeling is an accident of matter, which has flexibility as its precondition. In effect, when a man’s arm dries up, the moisture has to withdraw from it; (assuming that it’s not amputated) the sensations will vanish from this part of the individual. If feelings were produced in this man by a cause independent of matter; feelings would reside in this dried body part independently of the accident which happened to the matter, or by its blind caprice. Prove that Individuals have an active principle aside from, and independent of matter, and you will do away with all accidents.

We proceed the same way with respect to thought. We see that it is modified in animals relative to their organization: in children it is weak, while it’s robust in their maturity: it is weakened by their decline: it follows the path of nature; therefore, it depends on it. All the brains of animals are internally composed of softer, spongier parts than the other parts of their body; in the brain’s capacity there is, more than in any other, proportionally speaking, a radical humidity, a quality which participates both of the humid and the refined; thus, the brain is the Seat of Thought, as the external surfaces of the members are of Touch. The drying of the radical humidity is the final term of thought, as the drying of the external parts are of Touch. The least derangement of the humors in the brain influences Thought; a little wine makes it lively, with too much liquor it comes unhinged. Therefore, thought is a result of matter combined in various forms. Clearly, there is no question of resolving affirmatively here precisely how the effects of feeling and Thought are produced; but only to establish that they are the results of the material Substance. From the fact that sensation is seen to appear and disappear consequent to certain modifications in the body, it doesn’t follow that these apparent and clear modifications are what produce it; but the result is a steady proof of the analogy between the modifications we perceive and the accident of sensation: for the circumstances are always the same.

If I principally meant to refute the Philosophers, partisans of the First Cause, who only posit Thought in man, I would pursue anatomical demonstrations to show that the brains of the creatures we call brutes contain both the same materials as humans, and these in the same proportions as us; and that each animal has exactly as much of this thought as it needs for self-preservation; that these materials vary in quality in humans, and that, since the experience of society teaches us that there are Beings of this sort which have only very few ideas; anatomical experience also indicates, by the similarities it shows us, what degree of intelligence was possessed by such an Individual. But this is not my subject. It was only about showing how the world could have been produced. I’ve proved, with mathematical arguments, how motion is produced; and if, with respect to feelings and thought, my negative proofs have any sway, then my aims have been fulfilled. It would be useless to stop to examine how the world is maintained. It only takes a pair of eyes, or self-reflection, to be convinced of the material nature of the means used in this maintenance: and I venture to guarantee, as I finish here, that these material means used in the preservation of the world are a very tangible proof of the materiality of the cause which produced it.

1. “Happy is he who was able to know the causes of things”, from Virgil’s *Georgics* (II, 490) [↑](#footnote-ref-1)
2. Translator: Horace, *Epistulae,* I, 11. [↑](#footnote-ref-2)