

Class #10 - Monads, Truth, Minds, and Bodies
Leibniz, Monadology, Discourse on Metaphysics §1-§25, "A New System of Nature"

I. Leibniz Background

We started the term looking at Descartes's work, to which all of the philosophy we will study is, to some degree, a response.

Descartes attempted to accommodate the new science into an orthodox, theological world view.

We then looked at the work of two philosophers, Hobbes and Spinoza, who presented very different views of the world.

Both Hobbes and Spinoza were eager to dismiss the religious orthodoxy.

Leibniz rejects the materialism of Hobbes, the atheism (or at least naturalism) of both Hobbes and Spinoza, and the view, found in both Hobbes and Spinoza, that everything is necessary.

Indeed, Leibniz's attempt to rehabilitate a standard view of contingency and human freedom is central to his work.

Still, there are Spinozan elements to Leibniz's work which we can see especially in his claim that every living thing reflects the entire universe, its past and its future.

While Leibniz's philosophy is closer to that of Descartes, broadly speaking, they differ on many details. In particular regarding bodies, Descartes had argued, as part of his embrace of the new science and its mechanics, that bodies are essentially extended, passive and unthinking, infinitely divisible, individual substances.

Descartes saw the physical world as geometry enmaterialied, with the concomitant epistemic status of mathematics.

In contrast, Leibniz rejects the infinite divisibility of matter, holding that there are atomic components of the world called monads.

Leibniz rejects Descartes's claim that the ultimate constituents of the material world are passive, believing that in order for them to be substances, they have to have within them a source of action.

Leibniz believes that the claim that bodies are unthinking leads to the impossibility of thought.

For Leibniz, the fundamental components of the world are not inert divisible matter, but active, mind-like substances.

Each portion of matter can be conceived as a garden full of plants, and as a pond full of fish. But each branch of a plant, each limb of an animal, each drop of its humors, is still another such garden or pond (M67, AW 281b).

Still, Leibniz's work is, like Descartes's, an attempt to recapture much of the prevailing, and preceding, theological view of the world.

Leibniz's reactionary views include embracing both efficient and final causes.

According to Aristotle, there are four different kinds of causes:

- C1. Efficient cause: the source of a change (basically our contemporary notion)
- C2. Final cause: the goal, or telos, of an object or event
- C3. Material cause: the constituent matter of the object
- C4. Formal cause: what it is to be an object

Galilean physics denigrated C2-C4, focusing on C1.

Leibniz, seeking a return to an admittedly anthropocentric view of God's role in the universe, looked to rehabilitate the notion of a final cause.

According to Leibniz, bodies act according to laws of efficient causation, but souls act, like God, according to laws of final causes.

It would be best to join together both considerations, for if it is permitted to use a humble comparison, I recognize and praise the skill of a worker not only by showing his designs in making the parts of his machine, but also by explaining the instruments he used in making each part, especially when these instruments are simple and cleverly contrived. *And God is skillful enough artisan* to produce a machine which is a thousand times more ingenious than that of our body, while using only some very simple fluids... (D22, AW 237b-238a)

For Leibniz, these two systems of final and efficient cause work together, in parallel.

Our study of Leibniz's work will focus mainly on two, comprehensive presentations of his philosophy, the *Monadology* and the *Discourse on Metaphysics*.

These two works cover much of the same material, though with different emphases.

In the next three classes, we are going to examine five elements of Leibniz's world-view:

1. Monads
2. The Complete-World View of Substance
3. The Mind/Body Distinction
4. Theodicy
5. Freedom and Harmony.
6. Leibniz's controversy with Newton over the nature of space and time

Like Descartes, Leibniz was an profoundly influential mathematician.

Leibniz and Newton independently developed the calculus of infinitesimals, without which the physics of the late 17th century and beyond would not have been possible.

Newton and Leibniz fought for credit for the development of calculus, and the powerful Newton prevented Leibniz from gaining university employment in England, which he had sought.

The correspondence conducted between Leibniz and Newton's secretary Samuel Clarke regarded the question of whether space is an absolute receptacle in which matter is contained (Newton) or whether there is no space independently of the relations among material bodies (Leibniz).

We start with the fundamental substances of the world, which Leibniz calls monads.

II. Monads

If the basic metaphysical question is, "What is there?", the consensus answer among the moderns is, "Substance."

Then, they haggle over the details.

Differences among them regarding the specific nature of substance characterize their different theories.

For Descartes, there are two kinds of substance, each with its own essential trait: mind (consciousness) and body (extension).

For Hobbes, there is only one kind of substance: bodies.

For Spinoza, there is only one instance of a substance: God, or Nature.

Leibniz accepts the multiplicity that we ordinarily assume and which we see in the work of Descartes and Hobbes, rejecting Spinoza's unity.

But, he adopts Spinoza's views on the ubiquity of mind and his claim that substance has to have an internal agency.

For Leibniz, substance is an active unity, always perceiving, with the ability to will.

In the *Discourse*, Leibniz characterizes the monad as a substantial form, a soul or a haecceity, the thing which underlies or collects all its properties.

In the *Monadology*, Leibniz argues for the existence of simple substances on the basis of the obvious plurality of things.

Since there are composites, these must be made of parts.

A Cartesian piece of extended matter can be divided into further pieces of matter.

You can never get to simple parts by taking extended bodies as substances.

Leibniz argues that if there are no simple parts, there can be no composites.

Thus, there must be some basic elements.

He calls these basic elements monads.

The relation between these simple substances and the bodies or composites that we see is like the relation of a rainbow to drops of water and refracted light.

We think of bodies as coherent wholes, but they are really just accidental unities of real substances.

So far, Leibniz sounds like the Greek atomists like Democritus or the 17th century atomists like Gassendi.

The difference between atoms and monads, though, is striking.

For the atomists, the simple objects are passive and essentially undifferentiable; they are all alike.

Leibniz denies both the passiveness and the identicalness of atoms..

So we can see two reasons for Leibniz's denial of atomism.

First, Leibniz takes each monad to be an active, rather than passive unity.

Passive machines could never think.

Perception, and what depends on it, is inexplicable in terms of mechanical reasons, that is, through shapes and motions (M17, 276b).

Leibniz considers walking inside the [mechanical parts of a thinking substance](#), like a brain.

All we would see would be moving parts.

We would see no memory, no thought.

Leibniz's thought experiment persists in importance today.

Consider Ned Block's Chinese Nation example, ordinarily used to argue against functionalism in the philosophy of mind.

The brain is essentially a collection of neurons which discharge impulses from one to another.

Neurons fire, and induce other neurons around them either to fire or not to fire.

The story is obviously more complicated than that, but the differences are a matter of degree, not of kind.

Neurons transmit information like electrons passing along a circuit board.

Imagine that we have mapped the brain, and it contains one billion neurons.

(This is a fiction, but only by a factor of about a hundred - there are about a hundred and thirty billion neurons in the brain.)

We can set up the people of China to act as our billion-neuron brain, with walkie-talkies connecting each person to surrounding people.

We give each person the instructions to transmit information in the way that our neurons do, to other

people, as our mapping of the brain indicates.

The Chinese-Nation brain can even be attached to human-looking robot with receptors that function like our sense organs.

Information can be transmitted to the Chinese brain and back to the robot via radio signals.

The result would be a creature that looked and functioned just like us with an artificial processing system made out of the people in China.

Leibniz imagines just this sort of case, and concludes that such contraptions could not support thought.

When inspecting its interior, we will only find parts that push one another, and we will never find anything to explain a perception (M17, AW 276b).

Since there is no thought in a mechanical body, Leibniz argues, there must be some essentially active, essentially perceptive, component to the basic elements of the world.

We need active components in order to account for minds.

The perceptions of these monads will distinguish them, thus denying the atomist's uniformity.

We are each monads and it is clear that we are all different.

Leibniz's second reason for denying atomism, the claim that the elemental substances are identical, derives from his use of a principle of sufficient reason.

He argues that there could be no two objects that did not have some internal difference.

It is also necessary that each monad be different from each other. For there are never two beings in nature that are perfectly alike, two beings in which it is not possible to discover an internal difference, that is, one founded on an intrinsic denomination (M9, AW 276a).

This latter claim, that there can not be two identical objects in the world, is known as the identity of indiscernibles.

It follows, Leibniz argues, from his two great principles, contradiction and sufficient reason.

Our reasonings are based on *two great principles, that of contradiction*, in virtue of which we judge that which involves a contradiction to be false, and that which is opposed or contradictory to the false to be true...And *that of sufficient reason*, by virtue of which we consider that we can find no true or existent fact, no true assertion, without there being a sufficient reason why it is thus and not otherwise, although most of the time these reasons cannot be known to us... (M31-2, AW 278a).

I'll call the principle of contradiction PC and the principle of sufficient reason PSR.

Alternatively, for Leibniz, we can take PSR as holding that there is no effect without a cause.

As Leibniz notes, though, these reasons can be obscure, hidden from our view.

PSR, especially in its second version, seems almost definitional, and uncontroversial.

But, since Leibniz wields PSR to substantial conclusions it is worth noting that he thinks of it as following from a more substantial thesis, his conception of truth as a claim in which a predicate is contained in a subject.

III. PSR, PC and Truth

Leibniz discusses his theory of truth in the *Discourse*.

All true predication has some basis in the nature of things and...when a proposition is not an identity, that is, when the predicate is not explicitly contained in the subject, it must be contained in it virtually (D8, AW 228).

Note that Leibniz is dividing all true propositions into basic ones, in which the predicate is explicitly contained in the subject, and derived ones, which follow by analysis.

Finite analysis leads us to necessary truths.

But infinite analysis is required for contingent truths, so can only be completed by God.

There must also be a *sufficient reason* in *contingent truths*, or *truths of fact*, that is, in the series of things distributed throughout the universe of creatures, where the resolution into particular reasons could proceed into unlimited detail because of the immense variety of things in nature and because of the division of bodies to infinity. There is an infinity of past and present shapes and motions that enter into the efficient cause of my present writing, and there is an infinity of small inclinations and dispositions of my soul, present and past, that enter into its final cause (M36, AW 278b).

The difference between truths known by finite analysis and truths only knowable by infinite analysis grounds Leibniz's account of free will, which is central to his rejection of Spinoza's philosophy.

Both kinds of Leibnizian analysis, completed, will lead to basic truths.

The basic truths are known according to PC.

Their denials are explicit contradictions and we can see them immediately, as when we deny our own existence of the self-identify of any object.

The denials of complex claims will also lead to contradictions but they are not so obvious.

We must analyze the complex claim into its simpler components to reveal the contradiction.

So there is no explicit contradiction in M.

M. David is a married bachelor.

Another way to put the point is that M is not logically false.

But, if we substitute 'unmarried man' for 'bachelor', we transform M into a claim in which the contradiction is explicit.

M'. David is a married unmarried man.

By analyzing M into M', we have revealed, explicitly, a contradiction that had been merely implicit. The methodology of analysis, without Leibniz's heavy metaphysics, is the foundation of twentieth-century analytic philosophy, having been adopted by Frege, Russell, the early Wittgenstein, and the logical empiricists.

The twentieth-century analytic philosophers relied on the new tools of mathematical logic to help perform rigorous analyses.

Contemporary analytic philosophers have mainly abandoned the central claims of analysis, especially that the proper method of philosophy is analysis of complex expressions into their component parts.

But, they have held on to the idea of using formal logic as a support to rigorous thinking.

From his theory of truth as conceptual containment, Leibniz derives PSR.

If some effect did not have a cause, if some truth had no reason, Leibniz argues, then there would be a claim whose subject did not contain its predicate.

Since the definition of truth requires that all true claims have subjects which contain, either implicitly or explicitly, their predicates, the principle of sufficient reason follows.

IV. The Identity of Indiscernibles and the Second Argument Against Atomism

We are still looking at Leibniz's arguments against atomism as a way of understanding the nature of monads.

Leibniz provides two arguments against atomism.

The first argument is that to take atoms as the basic components of objects entails denying the possibility of thought.

The second argument requires appeal to a further general principle, the identity of indiscernibles (II). Leibniz argues to II from PSR:

- II1. If there were two indiscernible individuals, a and b, in our world, W, then there must also be another possible world, W*, in which a and b are "switched".
- II2. God could have had no reason for choosing W over W*.
- II3. God must have a reason for acting as he does, by PSR.
- IIC. Therefore, there are not two indiscernible (identical) individuals in our world (Adapted from SEP entry on Leibniz, §3.5).

Here's a contemporary (second-order) logical version of the identity of indiscernibles, for the sake of clarity among those who speak the language:

$$\text{II} \quad (\forall x)(\forall y)(\forall F)[(Fx \equiv Fy) \supset x=y]$$

The claim is that if any two objects share every property, they must be the same object.

Be careful not to confuse the controversial II with its almost incontrovertible converse, known as Leibniz's law:

$$\text{LL} \quad (\forall x)(\forall y)(\forall F)[x=y \supset (Fx \equiv Fy)]$$

LL just says that if two names refer to the same object, then the same properties hold of the referent under each name.

Given the identity of indiscernibles, simple substances must have distinct properties.

Since atoms are all alike, monads must not be atoms.

These fundamental components of the world are independent, individual, perceiving, and active.

V. Monads and Perception

Among the properties of monads, the most essential is their ability to perceive, or express, the world.

Monads are representative in character; they express the way the world is.

And, they do not just express the way they are in the world.

They express the nature of the entire universe.

Since every present state of a simple substance is a natural consequence of its preceding states, the present is pregnant with the future (M22, AW 277a).

We will return to the way in which monads represent the universe below.

For now, it is important to get clear on the concept of perception, and how these active, simple monads perceive.

Notice that monads are mind-like.

One can call all simple substances or created monads entelechies, for they have in themselves a certain perfection...; they have a sufficiency...that makes them the sources of their internal actions, and, so to speak, incorporeal automata (M18, AW 276b-277a).

Only some monads have sense perception and memory; these we can call minds, or souls.

We are monads.

So is God, the super-monad whose existence, Leibniz believes, can be inferred from the harmony among the diverse ordinary monads.

There are actually four types of ordinary monads: humans, animals, plants, and matter.

[Notice the reactionary nature of Leibniz's claim, the affinity to Aristotle's categorization of the different kinds of beings.]

All monads, being simple substances, have internal causes, independence from other monads.

They are the causes of their own activity; they are not merely passive receptors.

Leibniz likens them to substantial forms.

Since monads are like minds, their changes are representations, or perceptions.

These perceptions are pre-arranged by God, in harmony with the perceptions of all other monads.

Descartes argued that the essential characteristic of a mind is consciousness.

Leibniz mainly adopts Descartes's claim.

But since Leibniz's class of entelechies is wider than Descartes's class of minds, Leibniz's characterization of the essential characteristic of substance will have to be correspondingly broader.

All monads perceive.

The perception of a monad consists in its ability to represent, from its internal state, the entire history of the universe.

The passing state which involves and represents a multitude in the unity or in the simple substance is nothing other than what one calls *perception*, which should be distinguished from apperception, or consciousness...This is where the Cartesians have failed badly, since they took no account of the perceptions that we do not apperceive. This is also what made them believe that minds alone are monads and that there are no animal souls or other entelechies (M14, AW 276a).

One person's modus ponens is another person's modus tollens.

Can you really believe that a drop of urine is an infinity of monads, and that each of these has ideas, however obscure, of the universe as a whole? (Voltaire, *Oeuvres complètes*, Vol. 22, p. 434)

VI. The Complete-World View of Substance

We have seen that Leibniz claims that true statements are ones in which the predicate is contained in the subject.

This claim has profound ramifications for the nature of a substance.

It means, in particular, that the concept of any substance has to contain all the properties that might be predicated of it.

We can say that the nature of an individual substance or of a complete being is to have a notion so complete that it is sufficient to contain and to allow us to deduce from it all the predicates of the subject to which this notion is attributed (D8, AW 228a)

Leibniz considers the subject and concept of Alexander the Great.

The substance must correspond to a complete concept, in order for Alexander to be a substance.

These complete concepts will differentiate individual substances.

The individual substance contains all of the attributes of Alexander.

The concepts may be analyzed down to true predications.

When we consider carefully the connection of things, we can say that from all time in Alexander's soul there are vestiges of everything that has happened to him and marks of everything that will happen to him and even traces of everything that happens in the universe, even though God alone could recognize them all (D8, AW 228b).

The history of the universe, past and future, can be seen in every individual substance.

We can call this claim the complete-world view of substance

Leibniz draws a remarkable series of consequences from the complete-world view:

A substance can begin only by creation and end only by annihilation...

A substance is not divisible into two...

One substance cannot be constructed from two...

The number of substances does not naturally increase and decrease...

Every substance is like a complete world and like a mirror of God or of the whole universe, which each one expresses in its own way (D9, AW 229a).

Leibniz does not argue directly for each of these claims, though we can see how they can hang together.

Since monads reflect the entire history of the universe, they must exist from creation to destruction, for all eternity.

Leibniz's arguments for monads rely on his rejection of Descartes's doctrine of infinite divisibility, so their indivisibility is apparent.

Similarly, monads are simple substances, so can not have parts, can not be composites.

VII. The Plenum

Leibniz's complete-world view is further explained by the interaction between the inter-connectedness of the universe and the independence of individual monads.

Everything is a plenum, which makes all matter interconnected. In a plenum, every motion has some effect on distant bodies, in proportion to their distance. For each body is affected, not only

by those in contact with it, and in some way feels the effects of everything that happens to them, but also, through them, it feels the effects of those in contact with the bodies with which it is itself immediately in contact. From this it follows that this communication extends to any distance whatsoever (M61, AW 280b).

The interconnectedness of all bodies continues today in physical theories, such as universal gravitation, which extend the force of one body on others to infinity.

In practice, this force is often negligible.

It is not clear that Leibniz thinks that the effects of one thing on another is ever quite that small.

Moreover, there is a problem interpreting Leibniz's statements about the plenum, since, strictly speaking, he believes that there are no bodies.

VIII. Minds and Bodies

We have been talking about bodies, and interactions.

For instance, Leibniz writes that organized bodies are divine machines.

A machine constructed by man's art is not a machine in each of its parts. For example, the tooth of a brass wheel has parts or fragments which, for us, are no longer artificial things, and no longer have any marks to indicate the machine for whose use the wheel was intended. But natural machines, that is living bodies, are still machines in their least parts, to infinity (M64, AW 281a).

But, this is casual talk, and we should know how to speak most seriously about Leibniz's views.

Strictly speaking, Leibniz is an idealist; he believes that there are no bodies.

Bodies are the appearances of monads.

I don't really eliminate body, but reduce it to what it is. For I show that corporeal mass, which is thought to have something over and above simple substances, is not a substance, but a phenomenon resulting from simple substances, which alone have unity and absolute reality. (Leibniz, Letter to de Volder, in *Philosophical Essays*, Ariew and Garber eds.: 181).

For Leibniz, there is a real world (monads), a phenomenal world (bodies), and an ideal world (space and time).

Monads are not in space because the concepts of space and time do not apply to the world of the monad.

The activity of monads is internal, which is what makes them substances (rather than affections).

Each monad has a series of perceptions.

Having perceptions is what makes them distinct from atoms, and what grounds the possibility of thought.

The life of a monad is like unfolding its inner core.

Human minds are monads of a particular sort.

For ordinary monads, the series of their perceptions are all unconscious.

Our internal perceptions often come to us, like well-ordered dreams, from ourselves.

Even for conscious monads, the series is often unconscious, as when we sleep.

Still, unlike Berkeley, Leibniz talks about bodies in a way that he does not think is illegitimate.

He argues that minds and bodies are subsumed by distinct laws.

Minds obey laws of final causes; bodies are governed by efficient causes.

Thus, Leibniz has still to resolve the problem of interaction between mind and body.

If bodies really were *just* the appearances of monads, then Leibniz wouldn't have much of a problem of interaction.

But, given that they obey different laws, the question of why minds and bodies seem to be so finely attuned arises: why are the laws governing final causes just the same as the laws governing efficient causes?

Leibniz's response to the problem of interaction is guided by his understanding of three predecessors. In addition to Descartes and Spinoza, Leibniz is influenced by Malebranche's occasionalism.

IX. Malebranche's Occasionalism

Descartes's work raises the problem of interaction.

Spinoza solves the problem of interaction by positing a parallelism that results from the unity of substance: mind and body are two different ways of looking at the same thing.

The part of Spinoza's claim that takes the body to be another perspective on the mind is amenable to Leibniz, who met Spinoza and read some of his work.

Leibniz was even accused of appropriating some of Spinoza's ideas.

But Leibniz rejects Spinoza's singularity of substance, embracing the multiplicity.

He can not say that bodies and mind are each perspectives on the same thing.

Still, his solution to the problem of interaction is clearly derived from Spinoza's.

It is also motivated by the problem of transeunt causation which motivates Malebranche's occasionalism.

Occasionalists argue that communication of motion among substances is impossible.

They see the problem of interaction (between mind and body) as a special case of a general problem of causal interaction (between any two things).

Let's take a moment to see the general problem.

The occasionalists were generally dualists, and the problem of interaction arises mainly for dualists.

Within a dualist framework, there are four kinds of causal interactions:

CI1. Body-body (e.g. when one curling stone transfers momentum to the next)

CI2. Body-mind (e.g. when one's body is harmed and the mind feels pain)

CI3. Mind-body (e.g. when I decide to take a walk, and my body gets up and goes)

CI4. Intra-mental (e.g. when I think about my children and that causes me joy)

We have seen that CI2 and CI3 are problems for the dualist.

But, CI1 is also a problem for Descartes.

Descartes claims that God both creates and preserves the universe, and that no one moment in any way necessitates the next.

Thus it appears that God is the immediate cause of what appear to be physical interactions.

The same problem arises for CI4, since there appears to be no more necessity in the order of my thoughts than in the order of events in the world.

The occasionalist argues that all types of causation are problematic.

Their central argument against CI1 is that bodies are passive, and thus can exert no force on each other.

When I see one ball strike another, my eyes ... seem to tell me, that the one is truly the cause of the motion it impresses on the other... . But when I consult my reason I clearly see that since bodies cannot move themselves, and since their motor force is but the will of God that conserves

them successively in different places, they cannot communicate a power they do not have and could not communicate even if it were in their possession. For the mind will never conceive that one body, a purely passive substance, can in any way whatsoever transmit to another body the power transporting it. (Malebranche, *The Search for Truth and Elucidations of the Search for Truth*, p 660).

On occasionalism, bodies themselves can do nothing but respond to the will of an active substance. Whenever a body is affected, there must be an agent to manage that interaction. In body-mind events, CI2, God intervenes to create a mental event whenever the body is affected. Thus, God does the moving. Some people read Descartes as an occasionalist.

X. Transeunt and Immanent Causation

Leibniz accepts that the problem of causation among passive bodies is a serious one, but he rejects the occasionalist's recourse to appeals to God to guide every interaction.

In solving problems it is not sufficient to make use of the general cause and to invoke what is called a *Deus ex machina*. For when one does that without giving any other explanation derived from the order of secondary causes, it is, properly speaking, having recourse to a miracle (*New System of Nature*, AW 273a).

Instead, Leibniz emphasizes the substantial independence of monads. Since substances are independent, they cannot affect one another. Monads, Leibniz says, are windowless.

Nothing ever enters into our mind naturally from the outside; and we have a bad habit of thinking of our soul as if it received certain species as messengers and as if it has doors and windows...The mind always expresses all its future thoughts and already thinks confusedly about everything it will ever think about distinctly (DM 26, AW 240b).

This isolation of each monad is essential to their character, to their completeness. The universe is multiplied many times over, in each monad.

There is also no way of explaining how a monad can be altered or changed internally by some other creature, since one cannot transpose anything in it, nor can one conceive of any internal motion that can be excited, directed, augmented, or diminished within it, as can be done in composites, where there can be change among the parts. The monads have no windows through which something can enter and leave (M7, AW 275b)

Transeunt causation is a term used to describe the interactions among substances, as when one billiard ball transfers its momentum to another billiard ball.

Immanent causation, in contrast, describes the connections among states within a substance.

The series of thoughts in one's mind might be described as immanently caused.

Leibniz denies the possibility of transeunt causation.

He argues that all causation is immanent.

The denial of the real existence of bodies entails that CI1 - CI3 are all moot.

Leibniz holds on to CI4, arguing that while there is no transeunt causation, there is internal, or immanent, causation.

Immanent causation is, as we have seen, guided by the will.

XI. Pre-Established Harmony

The problem of interaction for Leibniz, then, is not Descartes's problem of describing the interaction between mental substances and physical substances.

Strictly speaking, there are only mental substances.

Leibniz criticizes a further error in Descartes's accounts of causation and interaction.

Descartes claims that the soul can affect the body.

It would violate the laws of physics for souls to add motion into the universe.

Descartes believes he can avoid the problem by claiming that it does not violate physical laws for a soul to change the direction of a body.

Descartes argues correctly that quantity of motion (momentum) is conserved in a physical interaction.

In that, he anticipates Newton's laws of motion.

But Descartes misinterprets momentum as a scalar quantity, ignoring its vector (or directional) qualities.

He thus leaves open the option for a soul to interact with bodies without violating physical laws.

Leibniz believes that Descartes would have adopted his view of pre-established harmony if he had seen the error in his physics.

Descartes recognized that souls cannot impart a force to bodies because there is always the same quantity of force in matter. However, he thought that the soul could change the direction of bodies. But that is because the law of nature, which also affirms the conservation of the same total direction in matter, was not known at the time. If he had known it, he would have hit upon my system of pre-established harmony... (M80, AW 282b).

Leibniz's problem of interaction is also not the occasionalist's problem to account for causation generally. Instead, Leibniz's problem of interaction is to explain why, given the laws governing the series of perceptions and representations in the monad there is a parallel series in the appearances of the monad (i.e. the body) which are governed by strict physical laws.

In other words, he must explain why there appear to be transeunt efficient-causal interactions when there are only immanent, final-causal sequences of perceptions.

Leibniz solves his problem of interaction by proposing a system of pre-established harmony much like Spinoza's parallelism.

The soul follows its own laws and the body also follows its own; and they agree in virtue of the harmony pre-established between all substances, since they are all representations of a single universe (M78, AW 282a).

Leibniz's argument for parallelism is clearer in *New System of Nature*, 273a-b, than it is in either the *Monadology* or the *Discourse on Metaphysics*.

The central claim is that the appearances of bodies seem to follow the laws of efficient causation since they are designed by God to do so, in parallel with the pre-programmed series of perceptions of the soul.

Without transeunt causation, the relations among monads are just pre-established harmony.

God puts the universe in motion in such a way that the mind and body seem to affect each other, and such that monads seem to affect each other.

Immanent causation, the relations among perceptions of a monad, are not impugned.

But, the appearance of transeunt causation is, as it was for Spinoza, an illusion.

While this pre-established harmony undermines the freedom of the will, by positing a determined sequence of events, it also makes that freedom easier to describe, since interactions among bodies need not be taken as governed by external laws.