

**Descartes**



**1596-1650**

# **DESCARTES' SCIENCE**

# **MINDS, BODIES, AND GEOMETRY**

Perhaps the most important feature of Descartes' ontology is his belief that there are only two kinds of things in the universe: corporeal bodies and minds:

Extension is the essence of corporeal bodies.

Thought is the essence of minds.

The only modes (attributes) of corporeal bodies are size, shape, and motion. In this respect, he maintains a version of the corpuscularian hypothesis.

Unlike Aristotle, he maintains that all the accidents in a corporeal substance must be understood through its essence, extension.

And because of this, unlike Aristotle, his material bodies are just objects of geometry.

He provides three main arguments for these views:

## 1. *The Complete Concept Argument*

Descartes argues that although we can understand 'figure' without understanding 'circle', we cannot understand 'circle' without understanding 'figure'. So 'circle' is not, he suggests, a complete concept. He then keeps chasing these concepts back until he reaches the concept he thinks is complete, and this we call 'corporeal'. He asserts that there must be a substance in which all of these concepts inhere, and this we call 'body'.

Next he does the same with concepts like 'willing' until he reaches the concept we call 'cognitive', and the substance in which all of these concepts inhere, he claims, we call 'mind'. "But after we have formed two distinct concepts of these two substances, it is easy, from what has been said in the Sixth *Meditation*, to know whether they are one and the same or different." (Ariew p. 65)

There is an assumption here that a complete concept must inhere in a substance, and that different complete concepts must inhere in different substances. This dualism is going to cause trouble.

## 2. *The Argument from Objective Reality*

In the *Meditations* he argues that we have clear and distinct ideas of corporeal bodies because we can do geometrical proofs of them. But we also know that we are not the cause of these ideas. So they must exist in an objective reality.

Unfortunately, Descartes needs to show something stronger than this: He needs to show not just that bodies have geometrical properties, but also that these are the only properties they have.

### 3. *The Argument from Elimination*

Even if we never sensed hardness, color, etc., things would not lose the nature of body.

“... the nature of matter, or of body regarded in general does not consist in the fact that it is a thing that is hard or heavy or colored or affected with any other mode of sense, but only in the fact that it is a thing extended in length, breadth, and depth.” [*Principles*, Part II, art. 4]

With respect to hardness, he then argues that if we imagine a body receding from us when we try to touch it we would never sense hardness, but would not on that account say that it lost the nature of body. He concludes that hardness is not essential to bodies, and argues in a similar way about the other characteristics.

Unfortunately, he needs to show more than this. He needs to show that no body is really hard!



# REJECTION OF ATOMISM

Although Descartes accepted much of the new corpuscularian theory, he rejected two central theses of the ancient atomists:

1. He maintained that there can't be any empty space.

“The impossibility of a vacuum, in the philosophical sense of that in which there is no substance whatsoever, is clear from the fact that there is no difference between the extension of a space, or internal place, and the extension of a body. For a body's being extended in length, breadth and depth in itself warrants the conclusion that it is a substance, since it is a complete contradiction that a particular extension should belong to nothing; and the same conclusion must be drawn with respect to a space that is supposed to be a vacuum, namely that since there is extension in it, there must necessarily be substance in it as well.”

[Principles Part II, art. 16]

“It is no less contradictory for us to conceive a mountain without a valley than it is for us to think of ... this extension without a substance that is extended, since, as has often been said, no extension can belong to nothing. And thus, if anyone were to ask what would happen if God were to remove all body contained in a vessel and to permit nothing else to enter in the place of the body removed, we must respond that the sides of the vessel would, by virtue of this, be mutually contiguous. For, when there is nothing between two bodies, they must necessarily touch.” [*Principles*, Part II, art. 18]

The last argument was conceptual. It seems to have slid from *Necessarily all material bodies are extended things* to *Necessarily all extended things are material bodies*. This one deals instead with what is physically necessary. How does Descartes know that a vacuum in nature is physically impossible? (Note: The vacuum pump was invented by Robert Hooke in 1659.)

2. Moreover, he maintained that matter is infinitely divisible.

“We also know that there can be no atoms, that is, parts of matter by their nature indivisible. For if there were such things, they would necessarily have to be extended, however small we imagine them to be, and hence we could in our thought divide each of them into two or more smaller ones, and thus we could know that they are divisible. For we cannot divide anything in thought without by this very fact knowing that they are divisible.” Moreover, even if God “... had made something that could not be divided by any creatures, he certainly could not have deprived himself of the ability to divide it, since he certainly could not diminish his own power.” [Principles Part II, art. 20]

What was at issue for the atomists, however, was *natural* indivisibility, not the possibility of *supernatural* divisibility.

# **LAWS OF NATURE**

For Aristotle and his followers, each kind of substance had its characteristic behavior, which was determined by its substantial form. But for Descartes, who rejected substantial forms, the characteristic behavior of corporeal substance instead is given by a series of laws of nature.

He justified these laws on the grounds that God "... is immutable and always acts in the same way."

In the *Principles* he argues that there is one primary general law of corporeal nature, the Conservation Principle, and he then identifies three particular causal laws that follow from this.

## *The General Conservation Law*

“... as far as the general cause is concerned, it seems obvious to me that it is nothing but God himself, who created motion and rest in the beginning, and now, through his ordinary concourse alone preserves as much motion and rest in the whole as he placed there then.... Whence it follows that it is most in agreement with reason for us to think that from this fact alone, God moved the parts of matter in different ways than in which he first created them, and now conserves the whole of that matter in the same way and with the same laws with which he created them earlier, he also always conserves it with the same amount of motion.”  
[Principles Part II, art. 36]

*An illustration of the way Descartes understands this law:*

If a body A of size 3 and speed 5 collides with a body B of size 2 and speed 4, then the total quantity of motion of the system is 23. This quantity will be preserved after impact, though the two bodies may have different speeds and/or different directions after impact.



## *The Secondary Laws*

Law 1: “Each and every thing, insofar as it is simple and undivided, always remains, insofar as it can, in the same state, nor is it ever changed except by external causes.... And therefore we must conclude that whatever moves, always moves insofar as it can.” [*Principles* Part II, art. 36]

Law 2: “Each and every part of matter, regarded by itself, never tends to continue moving in any curved lines, but only in accordance with straight lines.” [*Principles* Part II, art. 37]

Law 3: “When a moving body comes upon another, if it has less force for proceeding in a straight line than the other has to resist it, then it is deflected in another direction, and retaining its motion, changes only its determination. But if it has more, then it moves the other body with it, and gives the other as much of its motion as it itself loses.” [*Principles* Part II, art. 40]

The second law above anticipates Newton, but causes Descartes problems with the planets, since they appear to move in a circular way rather than in a straight line. He tries to solve this by claiming that the planets are carried around the sun by a swirl of fluid called a vortex. (What he doesn't have, but needs of course, is Newton's notion of gravity.)

# **SOME IMPACT RULES**

If two objects are moving toward one another and collide:

If they are the same size and are going the same speed, after the collision they will both reverse directions.

If one is larger than the other and they are moving at the same speed, the larger one will continue in the same direction while the smaller one will reverse directions.

If they are the same size but one is moving faster than the other, the faster one will continue in the same direction while the slower one will reverse directions.

If two objects are moving in the same direction:

If the bigger one hits the smaller one, they will go off in the same direction at the same speed.

If the smaller one hits the bigger one, it will reverse directions and the bigger one will continue on at the same speed.

If one object is stationary and the other collides with it:

If the one at rest is larger, it will remain at rest while the other will reverse directions.

If the one at rest is smaller, they will both move in the same direction after the collision.

**PROBLEMS**

Descartes recognizes that there is a problem with relative motion.

To see the problem, imagine a person who is sitting in a chair on a ship at sea, and ask yourself whether or not she is in motion.

He tries to solve this problem by defining 'motion' as "... the transfer of one piece of matter or one body from the neighborhood of those bodies immediately contiguous to it and considered at rest, into the neighborhood of others."

But this leads to all kinds of problems:

1. He says that by "... one body, or one part of matter, I here understand everything which is simultaneously transported...." and the problem is that he has defined 'motion' as a change of contiguous bodies, and then defined 'body' as that which moves; so he is involved in a definitional circle.

2. Moreover, given his definitions of body and place, a resting body would seem to "blend" into the surrounding plenum.



3. There is also a problem of cohesion. On his view, a macroscopic body is, essentially held together by the relative rest of its constituent material parts. But this raises the obvious difficulty that the impact of such bodies should result in their dispersion or destruction, since there is nothing to hold them together.

4. Moreover, his relational view of motion is in conflict with some of the Impact Rules mentioned above (e.g., 2a and 2b).

5. When we come to Leibniz, we will see a beautiful objection to Descartes notion of motion (as speed), which is not the same as Newton's and Leibniz's notion of velocity.

# DESCARTES' MEDITATIONS

# MEDITATION I:

The Method of Methodic Doubt

## What the Meditations are supposed to achieve:

“... I had to raze everything to the ground and begin again from the original foundations, if I wanted to establish anything firm and lasting in the sciences.” [p. 27]

## The Method:

“... reason now persuades me that I should withhold my assent no less carefully from opinions that are not completely certain and indubitable than I would from those that are patently false. For this reason, it will suffice for the rejection of all of these opinions, if I find in each of them some reason for doubt.” [p. 28]

Does he diagnose the problem correctly?

Is it possible to carry it out?

He doubts his senses. Why?

They have sometimes deceived him and it is “... a mark of prudence never to place our complete trust in those who have deceived us even once.” [p. 28]

Aren't there at least some things, however, derived from the senses—e.g., that we have a body—that we cannot doubt?

***The Dreaming Hypothesis:*** I might be dreaming.

Based on this, he concludes that “... it is not improper to conclude ... that physics, astronomy, medicine, and all the other disciplines that are dependent upon the consideration of composite things are doubtful.” But this does not cast doubt on arithmetic, geometry, “... and other such disciplines, which treat of nothing but the simplest and most general things and which are indifferent as to whether these things do or do not in fact exist, contain something certain and indubitable.” [p. 29]

***The Evil Demon Hypothesis:*** “Accordingly, I will suppose not a supremely good God, the source of truth, but rather an evil genius, supremely powerful and clever, who has directed his entire effort at deceiving me.” [p. 29]

Now even arithmetic, geometry, and logic are thrown out.

The philosophical position that would result if *The Meditations* ended here is known as global skepticism. It asserts that we can't know anything.

## MEDITATION II:

The Cogito

I think, therefore I exist. "... this pronouncement, 'I am, I exist' is necessarily true every time I utter it or conceive it in my mind." [p. 30]

Some clarifications:

1. Descartes is using 'thinking' here in a very broad sense. It includes doubting, willing, affirming and denying, imagining, and sensing. So he might as well have said, "I am dreaming, therefore I exist."

2. He is not arguing as follows:

I am thinking.

Therefore, I am existing.

If he were the argument would either be invalid or it would contain a suppressed premise that "Anything that is thinking is existing," which he is not entitled to assume because it can be doubted.



3. Rather, it is functioning like a performative. Descartes' point seems to be that "I'm thinking but not existing" is contradictory in much the way the following claims are:

a. "I promise to pay you \$5, but I won't pay you."

b. "I now pronounce you man and wife, but I'm not marrying you."

c. "I am now uttering a sentence, but not this one."

4. In saying he is a thinking thing Descartes is not yet denying that he is also a body. His position in *Meditation II* is compatible with materialism.

Descartes now raises and responds to an objection.

He is claiming that he knows with greater certainty that he exists (while he is thinking) than he knows, for example, that a piece of wax he is looking at exists.

However, the only thing his senses tell him about the piece of wax are attributes it has which it might not have. Thus, its color, shape, and smell can change though it remains the same piece of wax.

“I do not grasp what this wax is through the imagination, rather, I perceive it through the mind alone.” [p. 33]

And insofar as I am entitled to judge that the wax exists based on my perceiving it, I am even more entitled to judge that I exist. “For it could happen that what I see is not truly wax. It could happen that I have no eyes with which to see anything. But it is utterly impossible that, while I see or think I see ..., I who think am not something.” [p. 33]

If Descartes' Meditations ended here he would be categorized as an epistemological solipsist.

There are two forms of solipsism:

Metaphysical solipsism asserts that only I exist.

Epistemological solipsism asserts that all I can know is that I exist.

Both forms of solipsism are positions philosophers have frequently been concerned to avoid and criticize ever since Descartes.

## MEDITATION III:

Two Cosmological Proofs for the Existence of God

Descartes now wants to make a move that is very clever. He asks himself what it is about the cogito that provides him with knowledge of its truth, and he concludes that he knows it because it is clear and distinct.

And he wants to maintain that he can know of any idea that is *that* clear and distinct that it is true. But he can't do this yet. Why not?

**Because God might be deceiving him! (Remember the nasty evil genius hypothesis!)**

So at this point Descartes needs to prove that God exists as a non-deceiver.

And he proceeds to propose two versions of the cosmological argument for the existence of God.

*Cosmological arguments* are characterized by the fact that they make some very general assumption about the world. They differ from *ontological arguments* which make no such assumption.

Descartes provides two definitions of God:

Descartes idea of God is an idea of “... a supreme deity, eternal, infinite, omniscient, omnipotent, and creator of all things other than himself ...” which “... clearly has more objective reality within it than do those ideas through which finite substances are displayed.” [p. 36]

And again later, he says that,

“I understand by the name ‘God’ a certain substance that is infinite, independent, supremely intelligent, and supremely powerful, and that created me along with everything else that exists—if anything else exists.” [p. 38]

# *DESCARTES' FIRST COSMOLOGICAL PROOF FOR THE EXISTENCE OF GOD (from my idea of God to God)*

Some preliminary points that may help:

1. Possible error lies only in judgments, and there primarily in judging that the idea resembles something located outside of me.
2. Formal vs. Objective reality: If an idea A ("man") represents some object X (man) which is F (rational), then F-ness (rationality) is in X formally, but in A objectively.
3. Substances have more objective reality than accidents or modes (because they don't depend for their existence on other things)
4. Infinite substances have more objective reality than finite ones (The Great Chain of Being = existence is a perfection, and the greater amount of being a thing has the better it is).
5. If the objective reality of an idea is so great that the same amount of formal reality cannot be found in me, then I cannot be the cause of that idea.

**The purpose of the argument is to show that my idea of God could only have come from God.**

## PART I:

*Premise 1:* When it comes to substances, I have ideas of myself, of God, of angels, of animals, of corporeal objects, and of other men like me.

*Premise 2:* I could have created my ideas of animals and of other men and angels from the idea I have of myself, the ideas I have of corporeal things, and the idea I have of God.

*Premise 3:* I could have created my ideas of corporeal objects from my idea of myself.

*Premise 4:* There is no problem with respect to my idea of myself.

*Conclusion 1:* The only idea whose origin I have not yet been able to account for is the idea of God.



## PART II:

*Premise 5:* The gradual increase in my knowledge shows that my idea of myself is an idea of a finite and imperfect substance.

*Premise 6:* My idea of God is an idea of an infinite and perfect substance.

*Premise 7:* In order for a given idea to contain a certain amount of objective reality, it must derive it from some cause which contains at least as much formal reality as there is objective reality in the idea.

*Premise 8:* The objective reality of the idea of God must be derived from some cause which contains at least as much formal reality as there is in the idea.

*Conclusion 2:* The attributes of God are such that they could not have come from me.

## PART III:

Premise 9: Substances have a greater amount of formal reality than modes or accidents.

Premise 10: Infinite substances have a greater amount of formal reality than finite substances.

*Premise 11:* If the attributes of God are such that they could not have come from me, then the idea of (the substance) God could not have come from me.

*Premise 12:* If the objective reality of an idea cannot come from me, it must come from something else.

*Premise 13:* The cause of this idea must have as much reality and perfection as the idea.

*Conclusion 3:* My idea of God must have come from God.

*DESCARTES' SECOND COSMOLOGICAL PROOF FOR THE  
EXISTENCE OF GOD (from my existence to God's)*

*Premise 1:* There must be at least as much reality in the cause as in the effect.

*Premise 2:* The same power and action are needed to preserve something in existence as would be needed to create it anew.

*Premise 3:* I don't have enough power to preserve myself in existence, since if I did have that much power I would know it, and besides, I would not lack anything.

*Premise 4:* I am a thinking thing.

*Premise 5:* The hypothesis that my parents are responsible for creating and preserving me only leads to an infinite regress.

*Conclusion:* Only an infinite thinking thing could be the cause.

MEDITATION IV:

The Problem of Error

A new problem now arises for Descartes. Hasn't he proven too much? For how is he to account for error?

Deception is incompatible with God. Yet, not only did God create me, he also created my faculties, including my faculties of judgment and willing. However, I make mistakes.

Descartes solves this problem by blaming himself.

The faculty of understanding that God gave him is finite. It is the essence of a finite intellect not to understand many things, and the essence of a created intellect to be finite. His faculty of willing, on the other hand, because it is indivisible, when viewed in itself, is perfect.

“What then is the source of my errors? They are owing simply to the fact that, since the will extends further than the intellect, I do not contain the will within the same boundaries; rather, I also extend it to things I do not understand. Because the will is indifferent in regard to such matters, it easily turns away from the true and the good; and in this way I am deceived and I sin.” [p. 43]

There is a sense in which it is a greater perfection in me to be able to make mistakes than would be the case were I incapable of doing so.

So, although God could have made me more perfect, the whole is greater if some of its parts are not immune from error.

Does this solve the problem? Is it always the case that when I will and make a mistake it occurs because I haven't taken the time to understand that I should have taken?

## MEDITATION V:

The Essence of Material Things and an Ontological  
Proof for the Existence of God



*DESCARTES' ONTOLOGICAL PROOF FOR THE EXISTENCE  
OF GOD*

*Premise 1:* God is a being than which none greater can be conceived.

*Premise 2:* Existence is a perfection.

*Conclusion:* God exists.

Descartes notes here that only of God is it true that his essence implies his existence.

Note: This argument is simply borrowed from St. Anselm (1033-1109). We are going to have more to say about it later in the course.

*DESCARTES' STRATEGY HENCEFORTH*

Descartes now suggests that he is going to use the claims 1) that any idea that is clear and distinct is true, together with 2) that God is no deceiver, to establish many things.

For example, since he has a clear and distinct idea that the square of the hypotenuse is equal to the squares of the other two sides, and since God is no deceiver, it follows that this idea is true and that he knows it.

# MEDITATION VI:

*THE EXISTENCE OF MATERIAL THINGS*

## *DESCARTES' PROOF THAT MATERIAL OBJECTS EXIST*

*Premise 1:* I have a passive faculty of sensory perception, i.e. of getting and recognizing ideas of sensible objects.

*Premise 2:* I could not have such a faculty unless there existed some active power, either in myself or in something else, to produce or make the ideas.

*Premise 3:* This power certainly cannot exist in me, for it presupposes no action of my intellect; sensory ideas are produced without my cooperation and often against my will.

*Conclusion 1:* So, the power inheres in some substance other than myself.

*Premise 4:* This substance must contain at least as much formal reality as exists objectively in my sensory ideas.

*Conclusion 2:* So, this substance is either a body (i.e. a material substance) which contains whatever is contained objectively in my ideas; or it is God or some other creature superior to a body, which contains the reality of my ideas in a higher form (eminently).

*Premise 5:* But God has given me no faculty to discover the origin of my sensory ideas and a strong inclination to believe that these ideas proceed from bodies.

*Premise 6:* If God were to cause these ideas in me, either directly or by means of some creature other than bodies, God would be a deceiver.

*Premise 7:* But God is no deceiver.

*Conclusion 3:* I may therefore conclude that there exist bodies which are the causes of my sensory ideas of bodies.



*THE ARGUMENT FOR THE DISTINCTION BETWEEN MIND  
AND BODY*

*Premise 1:* I have a clear and distinct idea of my body as something extended/divisible.

*Premise 2:* I have a clear and distinct idea of myself as something un-extended/indivisible.

*Premise 3:* I have a clear and distinct idea that whatever is extended/divisible is not un-extended/indivisible.

*Premise 4:* God is no deceiver.

*Conclusion:* Mind and body can exist apart.

**Note:** All of Descartes' arguments now go like this.

Some indications that Descartes is in trouble and that he realizes it:

On p. 51 he says that, “By means of these sensations of pain, hunger, thirst, and so on, nature also teaches that I am present to my body not merely in the way a sailor is present in a ship, but that I am most tightly joined and, so to speak, commingled with it, so much so that I and the body constitute one single thing. For if this were not the case, then I, who am only a thinking thing, would not sense pain when the body is injured; rather I would perceive the wound by means of the pure intellect, just as a sailor perceives by sight whether anything in his ship is broken. And when the body is in need of food or drink, I should understand this explicitly, instead of having confused sensations of hunger and thirst. For clearly these sensations of thirst, hunger, pain, and so on are nothing but certain confused modes of thinking arising from the union and, as it were, the commingling of the mind with the body.”

Additionally, he seems to hedge his bet in the Synopsis of the Meditations, where he says:

“Finally, all the arguments on the basis of which we may infer the existence of material things are presented—not because I believed them to be very useful for proving what they prove, namely, that there really is a world, that men have bodies, and the like (things which no one of sound mind has ever seriously doubted), but rather because, through a consideration of these arguments, one realizes that they are neither so firm nor so evident as the arguments leading us to the knowledge of our mind and of God.” [p. 27]

To see some of the problem here ask yourself how minds, which are un-extended, are supposed to commingle with bodies, which are extended. And how are we supposed to count how many minds are there?

# SOME OTHER PROBLEMS WITH THE MEDITATIONS

## Meditation V:

Are mathematical truths *a priori*, as Descartes suggests?

Does his ontological proof work?

## Meditation IV:

Is his criterion of truth itself clear and distinct?

Is it really the case that all error/evil is due to lack of understanding—that we will before we understand?

## Meditation III:

The Cartesian Circle: Descartes tries to use logic to prove the existence of God, but he has already rejected logic in Meditation I.

If he fails here how are we supposed to avoid solipsism?

## Meditation II:

Hume's criticism: Is it really the case that I am aware of the existence of myself when I am thinking?

Maybe all I am entitled to say is that thinking is going on.

## Meditation I:

Does the fact that I can doubt suffice to show that a certain type of claim is not indubitable?