

Dialogue Concerning Two World Systems

- Date** ■ 1632
- Place** ■ Florence (city-state in Italy)
- Type of Source** ■ Fictional dialogue (original in Italian)
- Author** ■ Galileo Galilei
- Historical Context** ■ In 1615 Galileo tried to convince the church authorities in Rome that Earth revolved around the sun as Copernicus had theorized. The Inquisition instructed Galileo not to “hold, teach, or defend” Copernican theory. After the election of Pope Urban VII in 1623, Galileo tried to re-open the debate. The Pope was sympathetic but insisted Copernican theory could not be taught as fact. The *Dialogue* was an unsuccessful attempt to appease the Church while explaining the sun-centered system. The Inquisition forced Galileo to recant the next year.
- Internal Context** ■ Over four different days, the three characters discuss the strengths and weaknesses of the different world systems. Here they discuss why people do not feel a change in direction even as Earth turns under them.

Day Two

SIMP. Those who deny the **diurnal** motion to the earth because they do not see themselves being transported to Persia or Japan have been called by you just as dull-witted as those who oppose the **annual** motion because of the repugnance they feel against admitting that the vast and ponderous bulk of the terrestrial globe can raise itself on high and then descend to the depths, as it would have to do if it revolved about the sun annually. Now I, without blushing to be numbered among such simpletons, feel in my own mind this very repugnance as to the second point against the annual motion, the more so when I see how much resistance is made to motion even over a plain by, I shall not say a mountain, but a mere stone; and even the former would be but the tiniest fraction of an Alpine range. Therefore I beg you not to scorn such objections entirely, but to solve them; and not for me alone, but also for others to whom they seem quite real. For I think it is very difficult for some people, simple though they may be, to recognize and admit that they are simple just because they know themselves to be so regarded.

SAGR. Indeed, the simpler they are, the more nearly impossible it will be to convince them of their own shortcomings. And on this account I think that it is good to resolve this and all similar objections, not only that Simplicio should be satisfied, but also for other reasons no less important. For it is clear that there are plenty of people who are well versed in philosophy and the other sciences but who, either through lack of astronomy or mathematics or some other discipline, which would sharpen their minds for the penetration of truth, adhere to silly doctrines like these. That is why the situation of poor Copernicus seems to me lamentable; he could expect only censure for his views and could not let them fall into the hands of anyone who, being unable to comprehend his arguments (which are very subtle and therefore difficult to master), would be convinced of their falsity on account of some

SIMP.

Simplicio. This character presents the traditional Aristotelian/Ptolemaic views that the universe revolves around Earth. Supposedly he is named for Simplicius of Cilicia, an Aristotelian philosopher from the A.D. 500s, but the name can also mean “simple-minded.” Simplicio is a “straw man,” meaning his arguments are not meant to be taken seriously by the reader.

diurnal

daily. This is the motion of Earth caused by its rotation.

annual

yearly. This is the motion of Earth caused by its movement around the sun.

SAGR.

Sagredo. This character is supposedly neutral, raising objections to both theories. However, Sagredo quickly accepts the Copernican view. The character is named for Giovanni Francesco Sagredo, a personal friend of Galileo.

Dialogue Concerning Two World Systems

superficial appearances, and would go about declaring them to be wrong and full of error. If people cannot be convinced by the arguments, which are quite **abstruse**, it is good to make sure that they recognize the **vapidity** of these objections. From such knowledge comes moderation in their judgement and condemnation of the doctrine which at present they consider erroneous.

The first was that if it were true that the sun and other stars did not rise over the eastern horizon, but the eastern side of the earth sank beneath them while they remained motionless, then it would follow that after a short time the mountains, sinking downward with the rotation of the terrestrial globe, would get into such a position that whereas a little earlier one would have had to climb steeply to their peaks, a few hours later one would have to stoop and descend in order to get there.

The other was that if the diurnal motion belonged to the earth, it would have to be so rapid that anyone placed at the bottom of a well would not for a moment be able to see a star which was directly above him, being able to see it only during the very brief instant in which the earth traverses two or three yards, this being the width of the well. Yet experiment shows that the apparent passage of such a star in going over the well takes quite a while—a necessary argument that the mouth of the well does not move with that rapidity which is required for the diurnal movement. Hence the earth is motionless.

SIMP. Of these two arguments, the second really does seem persuasive to me; but as to the first, I think I could clear that up myself. For I consider it the same thing for the terrestrial globe to move about its own center and carry a mountain eastward with it, as for the globe to stand still while the mountain was detached at the base and drawn along the earth. And I do not see that carrying the mountain over the earth's surface is an operation any different from sailing a ship over the surface of the sea. So if the objection of the mountain were valid, it would follow likewise that as the ship continued its voyage and became several degrees distant from our ports, we should have to climb its mast not merely in order to ascend, but to move about in a **plane**, or eventually even to descend. Now this does not happen, nor have I ever heard of any sailor, even among those who have circumnavigated the globe, who had found any difference in such actions (or any others performed on board ship) because of the ship being in one place rather than another.

SALV. You argue very well, and if it had ever entered the mind of the author of this objection to consider how this neighboring eastern mountain of his would, if the terrestrial globe revolved, be found in a couple of hours to have been carried by that motion to where Mt. Olympus, for example, or Mt. Carmel is now located, he would have seen that by his own line of reasoning he would be obliged to believe and admit that in order to get to the top of the latter mountains one would in fact have to descend. Such people have the same kind of mind as do those who deny the **antipodes**

abstruse
difficult to understand

vapidity
emptiness, stupidity

The first
This objection claims that since a mountain would point in a different direction as the earth turns, at some point a climber would be able to go downward to reach the summit. Since that doesn't happen, the argument goes, Earth must not move. (See the diagram of Simplicio's views on page 3.)

The other
This objection claims that if Earth were moving, an observer in a well would only see a specific star for a very short time before Earth turned away from it. The solution to this is involves some complex geometry and is not included in this excerpt.

plane
Simplicio is referring to a geometric plane, an imaginary, straight, flat surface.

SALV.
Salviati. This character presents the Copernican view that Earth moves around the sun and that Earth rotates on its axis. The character is named for Filippo Salviati, another friend of Galileo.

antipodes
people living in the Southern Hemisphere

Dialogue Concerning Two World Systems

on the grounds that one cannot walk with his head down and his feet attached to the ceiling; they produce ideas that are true and that they completely understand, but they do not find it easy to deduce the simplest solutions for their difficulties. I mean, they understand very well that to **gravitate** or to descend is to approach the center of the terrestrial globe, and that to ascend is to depart from that; but they fail to understand that our antipodes have no trouble at all in sustaining themselves or in walking because they are just like us, having the soles of their feet toward the center of the earth and their heads toward the sky.

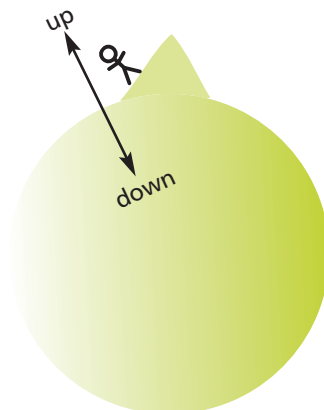
The dialogue continues by explaining how an observer in a well still sees the same part of the night sky even with his or her limited view and the earth apparently rotating away from it.

gravitate
pull. Galileo published several key insights into our modern understanding of gravity. The modern theory of universal gravitation, which is based on Galileo's work, was published in 1687 by Isaac Newton.

Simplicio



Salviati



Source: "Trial of Galileo Galilei: Dialogue Concerning the Two World Systems," *Famous Trials*, 2002, <<http://law2.umkc.edu/faculty/projects/ftrials/galileo/galileo.html>> (June 6, 2011).