

IBN SĪNĀ—AL-BĪRŪNĪ CORRESPONDENCE

Translated by Rafik Berjak and Muzaffar Iqbal

In this second installment of the correspondence between Ibn Sīnā and al-Bīrūnī, which is being serialized in *Islam & Science*, Ibn Sīnā responds to four questions raised by al-Bīrūnī. The first of these four is a criticism of Aristotle for his over-reliance on the views of the ancients concerning heaven. The second deals with Aristotle's view that there are only six directions to space. The third pertains to the issue of continuity and discontinuity of physical bodies and the fourth is about the Peripatetics' denial of the possibility of the existence of another world completely different from the one we know.

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15. **The second question:** Why did Aristotle consider the views of the ancients and predecessors concerning the heaven and their finding [the celestial bodies] to be just as how he found them to be, a strong argument for immutability and perpetuity of the heaven? Anyone who is not stubborn and does not insist on falsehood would agree that this is not a known [fact]. We do not know more [about the celestial bodies] than what has been reported by the people of the Book as well as by Indians and other nations like them, appears to be false upon investigation. This is because of the continuous changes [which occur] on the surface of earth, [changes] that occur in increments or all at once. Likewise, the obvious alterations in the state of mountains since antiquity is proof of events resulting in changes.

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16. **The answer:** You should know that [Aristotle] did not give [the views of the ancients] as an evidence; it was only something that came by way of speech which he mentioned at two places. [Further], the case of mountains does not apply to the celestial sphere; even if nations witnessed mountains preserved in their totality, [this observation] does not disclose changes resulting from the action of the elements on their different parts, some of which are collapsing and folding upon one another, and some of which are altering their shapes and undergoing other changes beyond these—changes which have been mentioned by Plato in his book *Fi Siyāsāt* as well as in other books. It is as if you have taken this objection from John Philoponos, who was opposed to Aristotle, simply because he himself was a Christian. However, whoever reads his commentary on generation and corruption and his other books would find that he agrees with Aristotle on this issue. Or [you may have derived your arguments] from Muḥammad ibn Zakariyyā' al-Rāzī, who meddles in metaphysics and exceeds his competence. He should have remained confined to surgery and to urine and stool testing—indeed he exposed himself and showed his ignorance in these matters. And you should also know that when Aristotle said “the universe has no beginning” he did not mean that the universe did not have a Creator; rather, he intended to exalt and protect the Creator from the charge of inaction, but this is not the place to discuss this.
17. And as for your saying, “anyone who is not stubborn and who does not insist on falsehood”: this is an ugly and rude insult—either you comprehended the saying of Aristotle in this matter or you did not. If you did not, your belittling of someone who said something beyond your grasp is inappropriate. And if you did understand, your comprehension of the meaning should have prevented you from dragging in this quarrel; for your pursuit of what your intelligence prevents you from pursuing is inappropriate.
18. **The third question:** Why do [Aristotle] and others say that there are only six directions to space? Their example is that of the cube, for which the six directions have parallels. If we add to these six tangent cubes, so that when the spaces are all filled in, there will be 27 cubes which will all be touching the first cube from angles and sides. And if the directions did not exceed that number, from which direction are

these cubes touching the first cube when these directions do not exist in the sphere?

19. **The answer:** The directions of any body are not parallel to its surface, but are rather hypothetical directions. The six directions that the philosophers meant are parallel to the extremities of the three dimensions of the body: the length, the width and the depth. In the third essay of his *Kitāb al-samāʿ al-ṭabīʿī*, wherein Aristotle discussed infinity, he argued that since a body is limited, it is necessary that its length, width and depth also be limited and that each one of these have two extremities, their total being six. What parallels them is also six. So that which is parallel to the extremity of length is next to the center of the world in which its length ends in the direction of the center, being below, while its opposite is above. And there is no name for the four remaining directions of a body, though that is only for living bodies. The direction of the extremity of the width in a living body, from which its movement arises, is called the right while its opposite is called the left. And the direction that parallels the extremities of the depth of the living body, is the one toward which the vision of the body is directed, and it is called front while its opposite is known as behind. These are the six necessary directions in every body.
20. Your denial of the six directions of the sphere is incorrect. If the sphere were a body, it should have length, width and depth, they all being limited with two extremities. The total thus being six. The directions parallel to these six extremities are also six. When the premise is right, all conclusions are right, and the conclusion here is that the sphere has six directions. So how is it then possible that the six directions of a body are parallel to its surface while it is known that the sphere has directions from its sides that are different in observation? The direction of the north pole is not the direction of the east or the west nor that of the south pole and likewise all other directions, and the same holds true for their correspondents. And if the surface of the sphere is one, then there is no one single direction, neither in the demonstrative proof—as we clarified—nor hypothetically, as it is necessary for the body to have directions parallel to the surface. It is possible for angular bodies to have directions parallel to their surfaces, because their surfaces are straight by their position and view but not by their structure. So what really

accompanies a body physically apart from their directions is what parallels its three extremities, and that is what the philosophers meant.

21. **The fourth question:** Why did Aristotle oppose the position of the atomists—though their stance that a body is divisible *ad infinitum* is absurd—in that if two bodies are moving in the same direction, one ahead of the other, they will be unable to overtake one another, even if the velocity of the first is less? Take, for instance, the example of the sun and the moon. If there were a certain distance between them and if both moved [in the same direction] but the sun traveling a shorter distance than the moon in the same amount of time and if this continued *ad infinitum*, we would see the moon overtaking the sun. The atomists are also opposed to other things well-known to engineers. And what I just mentioned about those who oppose the atomists is also very absurd, so how can we get rid of both [of these groups]?
22. **The Answer:** Firstly, it is not possible that a continuous thing that has no body, no surface, no length, no movement, no time, be composed of indivisible atoms. I mean a body without two dimensions and a middle upon which it is centered. Aristotle has explained it in the sixth chapter of *Kitāb samʿ al-kiyān* with strong logical and credible proofs; he has raised this objection himself and has provided an answer. But you should know that the saying of Aristotle that the body is divisible *ad infinitum* did not mean that it is actually divisible [but only potentially so]; it means [instead] that every atom in it has a middle and two dimensions. Some of these atoms are divisible into two parts adjacent to the two dimensions and the middle; these are the parts that are divisible in actuality. While other parts, even if they have a middle and a place to divide, are too small to be actually divisible; [hence] these parts are divisible [only] potentially and in themselves.
23. My objection should silence those who say that the body is divisible actually, but the one who says that some parts of the body are divisible in actuality and some parts are divisible only potentially is correct, because movement brings finite division of the congruent parts though this is not actual division. So, this is the way leading to these two absurd notions, coming from both sides. And whatever Aristotle has said in response to this matter has been interpreted by

interpreters only for the sake of argument and for finding fault with others. If it were not for my preference to avoid unnecessarily lengthening the matter, I would have mentioned all that, but whatever follows after already hitting the mark is sheer wastefulness and excessiveness.

24. **The Fifth Question:** Why did Aristotle oppose the possibility of the existence of another world, outside our world, made up of a different nature? We did not know the natures and the four elements until our existence here [in this world], much like the one born blind who, if he did not hear people mentioning vision, would not be able to imagine the process of vision by himself and would not be able to recognize colors. [We also cannot grasp] a world that has the same characteristics as this world but is moving in directions different than those of this world, if both these worlds are separated from each other by a barrier (*barzakh*). An example of this can be demonstrated by a hill on the surface of the earth defined by three points, A, B and C; A and C being close to the surface of the earth as compared to B. Naturally, water will flow from B to A or to C; and these are two opposite movements to a known point.
25. **The Answer:** This question is not mentioned in Aristotle's book, *al-samā' wa'l-Ālam*, as a denial of the existence of worlds other than this [world] because he did not address the case of those who claim the existence of worlds unlike this; he [only] responded to those who claimed the existence of worlds with skies, earths, and elements similar to this world in kind (*naw'*) and nature (*ṭab'*), with dissimilarity in character. And he supported this denial with the argument that "our reference to the world and the sky without specifying and without mentioning the elements is more general than our reference to a specific world or to this world from this part from this element." Thus the existence of other worlds beyond this one world specified by the elements is possible.
26. The possibility of eternal things is a necessity (*wājib*), thus the existence of many worlds is *wājib*. The existence of other worlds other than this world is a necessity; some people considered them limited and others unlimited, and all of them have proved their points. The Philosopher has refuted this argument in his *Kitāb al-samā' wa'l-Ālam* and he has made it clear that the existence of many worlds is not possible. Other philosophers said that the elements of the other

worlds are not different than those of this world but indeed, they have the same nature. The Master said that if the elements of many worlds are not different from each other in nature and the things that depend on nature, [then] they depend on the direction of their natural movement and the elements of many worlds depend on their natural positions. So, if they were found in different positions over one another, they would be stationary in these positions by force. And whatever happens by force, follows whatever happens by nature. It is known that [elements] were initially all together in one unit and they then separated and [hence] those who consider them to be different eternally end up with the impossibility of dealing with a situation in which they are eternally different and not different eternally and that is an impossible contradiction. And whatever comes by force necessarily vanishes and the thing returns to its original nature. So, those separated worlds will meet again though philosophers claim that they will never meet again, [hence we have a situation in which] they will meet and, on the other hand, yet they will not meet eternally. And this is [again] an impossible contradiction.

27. There is no doubt that whatever happens by force has a cause. And these bodies are not supposed to force each other from their natural positions or to move to meet in unnatural positions, because we have already established that forcing bodies are forcing each other to move until they end up with a body moving by nature. And if there were a body that was moving by force to an unnatural position, such as the elements of the worlds, it is necessary that another body would move in that direction by nature. There is also no body except that composed from these elements, because we have made it clear that there is nothing here that has a position by nature, so if we consider that what moves by nature to its natural position is other than those present in their places naturally, that would be a contradiction. Hence, there is no other body except for these since there is no other body different than these. We will further clarify the correctness of this later. So, the result of the previously mentioned antithesis is that none of these bodies force each other toward the movement of that direction, because none of them is moving to that direction by nature or otherwise. This is so because it has no forceful physical or non-physical cause because causes which are not bodies, like the things which the philosophers call "nature", "Intellect" (*'aql*) and the "First

Cause” (*al-‘illatul ulā*) do not change order to disorder; their job is to transform disorder into order or to hold the order in place, hence there is no automatic physical or non-physical cause to do this.

28. As for the accidental causes, such as chance, even if their aims are secondary, their causes are fixed by themselves—and whoever wants to clarify that should see the second article in the Philosopher’s book, *Fī Sam‘ al-kiyān* or our commentary on the first article in *Metaphysics*. We say that these have accidental causes while they also have natural causes. If we exempt the second premise, the logical result will lead to nullification of the first premise, and that is to say that there is no accidental or causal cause. People agree that it is impossible for a thing to be in this condition, and this is common sense. If books were not already full of refutations of this, I would have refuted it. And if a thing does not have an essential or an accidental cause, it would be impossible for it to exist without a cause. So, the existence of other worlds like this one is impossible, and this is what we wanted to clarify [in the first place].
29. I want to explain that the existence of a body other than these bodies is not possible in movement or characteristics because movement, by logical necessity, is either in a straight line or is circular. Assuming there is no vacuum, the moving bodies would be touching each other by necessity. Now, the linear movement is either toward the center or intersecting the center in its straight path, and is either coming from the two sides or is parallel to them. By nature, however, it is not permitted that the movement should be from one end to the opposite end or in relation to it. And all of this has been explained in Aristotle’s books, particularly in the fifth article of the book *al-samā‘ al-ṭabī‘* and in its commentaries as well as in some of our own works.
30. From this we understand that the natural movements are finite in all bodies, either from the center or to the center. And as for the sensory characteristics, it is not possible for the number of these to exceed nineteen, as the Philosopher has explained in the third article of his *Kitāb al-naḥs* and [has been explained] in the commentaries of Themistius and Alexander [of Aphrodisias] and others. Were it not for the length, I would have elaborated on this issue further but I just wanted to briefly mention it.
31. So, I say if nature does not give the higher kind the elements of the lesser kind, it will not be able to enter the second kind from the

second category. The example of this is the body, the first of the lowest kind. If nature did not give it all the characteristic qualities of bodies, it would not be able to bring it up to the second higher kind by relation, that being the plant kingdom. And if all plant qualities—such as the ability to nourish and to grow and to procure—were not present in this kind, nature would not be able to take it to the next higher kind, which is the animal stage and the characteristics of the animal stage are divided into sense and intentional movement. So if this lower kind did not get all the cognitive senses (*hiss al-madrakah*) to sense all things, the animal kind would not be able to develop to the speaking kind (*al-naw^c al-nuṭqī*). Nature has, however, created in those who are born (*mawālīd*), a speaking element. It is, thus, necessary that it gave them all sensory powers (*al-quwah al-hissiah*), and it followed these things with the speaking powers. So if the speaking kind has all sensory cognitive powers, then the speaking kind is aware of all the sensory things. Hence, there is no sensory thing except what the speaking kind can realize. There are no qualities but the sixteen that are sensed by themselves and three that are sensed accidentally, these being movement, rest and figure. There is no body that has any qualities except these. So, there is no other world opposite to this world with similar physical qualities. However, were there many worlds, they should be similar to this one, and we have already explained that there is no world similar to this one. So, to conclude, there is only one world and that is what we had wanted to clarify.

32. Know that if there were another way to discuss this issue, it would necessarily lead to an endless discourse, and that would harm science in a sense and would play into the hands of sophists. And their cure is not in this medicine but in another medications, and for this we seek Allah's help.

(To be continued)