

IBN SĪNĀ-AL-BĪRŪNĪ CORRESPONDENCE

Translated by Rafik Berjak and Muzaḥḥar Iqbal

In this first installment of the translation of correspondence between Ibn Sīnā and al-Bīrūnī's, *al-As'ilah wa'l-Ajwibah*, Ibn Sīnā responds to the first question posed to him by al-Bīrūnī who criticizes reasons given by Aristotle for denying levity or gravity to the celestial spheres and the Aristotelian notion of circular motion being an innate property of the heavenly bodies.

Keywords: Ibn Sīnā-al-Bīrūnī correspondence; criticism of Aristotelian natural philosophy; *De Caelo*; levity and gravity; heavenly bodies, circular motion; al-Ma'ṣūmī; celestial bodies; Islamic scientific tradition.

Translators' Introduction

Writing from Khwārazm, the modern Khiva and ancient Chorasmia, Abū Rayḥān Muḥammad b. Aḥmad al-Bīrūnī (362-442/973-1050) posed eighteen questions to Abū 'Alī al-Ḥusayn b. 'Abd Allāh ibn Sīnā (370-428/980-1037). Ten questions were related to various concepts and ideas in Aristotle's *al-Samā' wa'l-'Ālam* (*De Caelo*).

Ibn Sīnā responded, answering each question one by one in his characteristic manner. Not satisfied by some of the answers, al-Bīrūnī wrote back, commenting on the first eight answers from the first set and on the seven from the second. This time, the response came from Abū Sa'īd Aḥmad ibn 'Alī al-Ma'ṣūmī, whose honorific title, Faqīh, is indicative of his high status among the students of Ibn Sīnā. He wrote on behalf of his master, who was the most representative scholar of Islamic Peripatetic

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natural philosophy. “His long response thus brings to a conclusion this most challenging and remarkable set of exchanges between two of the greatest masters of Islamic thought, al-Bīrūnī and Ibn Sīnā aided by his pupil,” wrote Seyyed Hossein Nasr, “an encounter which in its rigour and significance of the questions involved marks one of the highlights of Islamic intellectual history and in fact medieval natural philosophy and science in general.”¹ Based on a critical edition of the text published in 1995,² this first English translation of *Questions and Answers* will be serialized in *Islam & Science*.



In the name of Allah the Most Merciful the Most Compassionate.

1. The Grand Master, Abū ‘Alī Al-Ḥussein Abū ‘Abdullah Ibn Sīnā— may Allah grant him mercy—said, All Praise is for Allah, the Sustainer of the worlds, He suffices and He is the best Disposer of affairs, the Granter of victory, the Supporter. And Allah’s blessings be upon our master Muḥammad and upon his family and all his companions, and now to begin:
2. This letter is in response to the questions sent to him by Abū Rayḥān al-Bīrūnī from Khawārazm. May Allah surround you with all you wish for,

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1. Nasr, Seyyed Hossein and Mohaghegh, Mehdi (1995), *Al-As’ilah wa’l-Ajwibah (Questions and Answers)*, International Institute of Islamic Thought and Civilization, Kuala Lumpur, 1995.
 2. Ibid. For a detailed note on “Questions and Answers” as a technique used extensively in the Islamic intellectual tradition, see Daiber, H., “Masā’il wa-Adjwiba” in *Encyclopaedia of Islam*, (new edition), vi, pp. 636-9, where Daiber mentions that “the oldest Islamic question-answer literature endeavours to solve philological and textual problems of the Kur’ān text.” He cites the correspondence between Ibn Sīnā and al-Bīrūnī on the basis of 1974 Turkish edition of the correspondence, ed. Ülken, *Ibn Sina risaleleri*, ii, 2-9; ed. M. Türker, in *Beyruni’ye armağan*, Ankara 1974, 103-12. Daiber also cites numerous other examples of correspondence literature. It is also relevant to note that at the time when this correspondence took place, the technique of *reduction ad absurdum* used by Ibn Sīnā in his response to al-Bīrūnī had already become a refined tool in this literature.

and may He grant you all you hope for and bestow on you the happiness in this life, and hereafter, and save you from all you dislike in both lives. You requested—may Allah prolong your safety—a clarification about matters some of which you consider worthwhile to be traced back to Aristotle, of which he spoke in his book, *al-Samāʾ waʾl-ʿĀlam*,³ and some of which you have found to be problematic. I began to explain and clarify these briefly and concisely, but some pressing matters inhibited me from elaborating on each topic as it deserves. Further, the sending of the response to you was delayed, awaiting al-Maʿṣūmī's dispatch of letter to you. Now, I would restate your questions in your own words, and then follow each question with a brief answer.

3. **The first question:** You asked—may Allah keep you happy—why Aristotle asserted that the heavenly bodies have neither levity nor gravity and why did he deny absence of motion from and to the center. We can assume that since the heaven is among the heaviest bodies—and that is an assumption, not a certainty—it does not require a movement to the center because of a universal law that applies to all its parts judged as similar. If every part had a natural movement toward the center, and the parts were all connected, then it would result in a cessation (*wuqūf*) [of all motion] at the center. Likewise, we can assume that the heaven is among the lightest of all bodies, this would not necessitate (i) a movement from the center until its parts have separated and (ii) the existence of vacuum outside the heaven. And if the nonexistence of vacuum outside the heaven is an established fact, then the heaven will be a composite body like fire. [And you also say] that the circular movement of the heaven, though possible, might not be natural like the natural movement of the planets to the east [which] is countered by a necessary and forceful movement to the west. If it is said that this movement is not encountered because there is no contradiction between the circular movements and there is no dispute about their directions, then it is just deception and argument for the sake of argument, because it cannot be imagined that one thing has two natural movements, one to the east and one to the west. And this is nothing but

3. *De Caelo*.

a semantic dispute with agreement on the meaning, because you cannot name the movement toward the west as opposite of the movement to the east. And this is a given; even if we do not agree on the semantics, let us deal with the meaning.

4. **The answer:** May Allah keep you happy, you have saved me the trouble of proving that heaven has neither levity nor gravity, because in your prelude you have accepted that there is no place above the heaven to where it can move to, and it cannot, likewise, move below because all its parts are connected. I say it is also not possible for it to move down, nor is there a natural place below it to where it can move, and even if it were separated—and we can make the assumption that it is separated—it would result in the movement of all the elements from their natural positions and this is not permissible, neither by the divine nor by the natural laws. And that would also establish vacuum which is not permissible in the natural laws. Therefore, the heaven does not have a natural position below or above to which it can move in actuality (*bi'l fi'l*) or in being, neither is it in the realm of possibility (*bi'l-imkān*) or imagination (*bi'l-wahm*) because that would lead to unacceptable impossibilities we have mentioned, I mean the movement of all the elements from their natural positions or the existence of vacuum.
5. There is nothing more absurd than what cannot be proved to exist either by actuality or by possibility or imagination. If we accept this, it follows that heaven does not have a natural position, neither at the top nor at the bottom. But every body has a natural position. And to this, we add a minor term and that is our saying: “heaven is a body”, and hence, it will follow from the first kind of syllogism (*shakl*) that heaven has a natural position. And if we could transfer the conclusion to the disjunctive positional syllogism, we could then say: its natural position is above or below or where it is. And if we hypothesize the negation of its being either above or below, we could say: it is neither up nor down; hence the conclusion is: it is where it is.
6. Everything in its natural position is neither dense or light in actuality and since heaven is in its natural position, it is, therefore, neither light nor dense in actuality. The proof of this is that whatever is in its natural position and is light, it will be moved upward because it is light and its natural position is upward but it cannot be said that whatever is light, is in its natural position in actuality because this will contradict what I have just said: it will be “in its natural position” as well as “not in its natural

position” at the same time; and that is self-contradictory. And likewise for the dense. Because the dense is what naturally moves downwards and its natural position is down because anything that moves naturally, its movement takes it toward its natural position. And from the first premise, it is clear that the thing in its natural position is not dense in actuality, so when we add the results of the two premises, the sum of this will be that whatever is in its natural position, is neither dense nor light in actuality. And it was established in the second minor term that the heaven is truly in its natural position, therefore, the correct logical conclusion is that the heaven is neither light nor dense in actuality and it is not so potentially (*biʿl-quwwa*) or contingently.

7. The proof of this is that the light and dense in potentia can be so in two situations: (i) It can be so either as a whole, like the parts of the fixed elements in their natural position, so if they were neither dense nor light in actuality, then they are so potentially, for the possibility of their movement by a compulsory motion which can cause them to move from and to their natural position either by an ascending or descending natural movement; and (ii) by considering the parts as opposed to the whole in the fixed elements. These parts are neither light nor dense in their totalities, because if it would move upward, some of the parts would move downward because they are spherical in their shapes and have many dimensions, but indeed, the levity and density are in their parts, so if the heaven is light or heavy potentially, that is in its totality—and we have proved that by nature, the up- or downward movement of the heaven is negated (*maslūb*) to its totality, and to prove that we depended on some of your premises. So it was made clear to us that the heaven in its totality is neither light nor dense. And I say that it is neither heavy nor light potentially in its parts because the levity and the density of the heavy and the light parts appear in their natural movement to their natural position. And the parts which are moving to their natural position move in two cases: (i) they might be moving from their natural position by force, [in which case] they would move back to their natural position by nature or (ii) they are being created and moving to their natural position like the fire that emerges from the oil and is moving up. It is not possible for a part of the heaven to move from its natural position by force because that requires an outside mover, a corporeal or non-corporeal mover that is not from itself.

8. The non-corporeal movers, like what the philosophers call nature and the active intellect (*al-ʿaql al-faʿāl*), and the First Cause (*al-ʿillat al-ūlā*), are not supposed to create forced movement (*ḥarakah qasriyyah*); as for nature, it is self-evident, and as for the intellect and the First Cause, their inability [to do so] is left to the Divine knowledge. As for the physical cause, it should be, if possible, one of the [four] elements or composed of them because there is no corporeal body other and these five—the four simple elements and [the fifth being] their combination.
9. And every body that moves by itself and not by accident, moves when it is touched by an active mover. And this has been explained in detail in the first chapter in the book of *Generation and Corruption* (*Kitāb al-kawn waʿl-fasād*). Thus, it is not possible for a part of the heaven to move without being touched by the mover during its movement toward it either by force (*biʿl-qasr*), or by nature (*biʿl-ṭabʿ*). The outside mover that moves it by force has to be connected to another mover, which in turn, has to be connected to the first mover of all. And if it was moving by nature, it will be either the non-composite fire or a combination in which the fire-parts are dominant. The non-composite fire does not affect the heaven because it engulfs it from all sides and the impact of bodies on bodies is by touch and there is no part in the heaven which is more passive than the other, unless one of the parts is weaker in its nature. However, the weakness of the substance does not come from itself but through an outside factor.
10. Thus, the question now returns to the beginning, to that of a compound mover in which the fire-part is dominant. It will not have impact until it reaches the sphere of the heaven and when it reaches the airy zone, then it will turn into pure fire and burst into a flame as seen in the case of comets. And if it is too slow to reach that transforming stage, it would not touch the heaven, [it may be so] because in it are dense parts, earthly and others, which have gravity. Thus, it is not possible for anything to touch the heaven except pure fire. It is possible for pure or non-pure fire—and the compound is not pure fire—and for the one that is not pure fire it is possible for it to be in the neighborhood of the three elements but it is not possible for it to touch the heaven by nature.
11. As for the other elements, it is not possible for them to touch the heaven in their totality because they do not move in their totality from their natural position, neither in their compound form nor in their

parts, thus, they cannot have any impact on the heaven because they are unable to touch it because when they reach the ether (*al-athīr*), they will burn and turn into fire and the fire does not touch heaven, as we have proved. But ether changes and disjoins everything that occurs in its [realm] because it is hot in actuality and one of the properties of the hotness in actuality is that it brings together similar genera and separates dissimilar genera—it is the separator of dissimilar and gatherer of similar genera. And when the fire takes over a body that is being affected by it, if it were a compound body made from different parts, the fire will return it to its nature; this shows that [the body] did not change into something that is contrary to its essence by mixing with the affective element. As for the cold, it is not like this. And there is no doubt that the hot is most effective and powerful of all things; and the thing that is in its natural position, strengthens its genus; and the whole is stronger than its parts. So what do you think of something that is hot in its natural position and it is whole, and it allows a part to enter into its sphere and it does not produce any affect [on this part], neither changes it back to its nature, nor separates it, if it were compound?

12. From these premises, it is clear that it is not possible for any part or compound from the elements to reach the heaven. Since they do not reach it, they do not touch it, and if they do not touch it, they do not produce any affect on it. None of the parts or the compounds has any affect on parts of the heaven and if nothing is able to affect it, other than it, from whole or parts, simple or compound bodies, it is not going to be affected and moved potentially by itself. And if we would set aside our premise—and that is our saying, “and it is not possible [for the heaven] to be affected by anything other than by itself”, which is true—the result is our saying: “it is not possible that it will be affected and moved by force”; and this is also true. So the heaven is neither light, nor dense potentially, neither as a whole or in its parts. And we have proved that it is not so in actuality. It is neither light, nor dense in general or absolutely. And that is what we wanted to clarify. But you can call the heaven light from the perspective in which people call a floating body, on top of another body, lighter than the latter by nature. So, from this perspective, it is possible that the heaven is the lightest of all things.
13. Now, as to your saying that the circular motion [of the heaven] is natural to it, and your saying, “if it is said that this is not accidentally” et cetera, there is no one among the scholars who has proven the natural

circular motion of the heaven, who has ascertained what you have said. I would have explained the reasons, had it not been a separate issue, taking too long [to explain].

14. As for your demonstration that the movement of the stars and the planets is opposite, it is not so. It is only different. Because the opposite movements are opposite in the directions and the ends, and if it was not that the high is opposite of low, then we would not have said that the movement from the center is opposite to the movement to the center; and this has been explained in detail in the fifth chapter of *Kitāb al-Samā' al-ṭabī'i*. As for the directions of the two circular motions and their ends, they are, in our assumption, positional, not natural. Because in nature, there is no end to the circular movement of the heaven, hence it is not opposite; hence the two different circular motions are not opposite and this is what we wanted to clarify.