

THE TEN INTELLECTS COSMOLOGY AND ITS ORIGIN

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I. al-Fārābī and Ibn Sīnā describe the celestial world in nearly identical way. The summary of their combined views runs as follows:

The One is perfect, so it is that from which existence is brought about. The second being emanates from the One and it is one and indivisible, because *ex uno fit unum*¹. This second being is the first intellect. It conceives the necessary existence of its own, that of the Supreme Being and its own contingency as compared to the One. These are three accidents on its essential unity. The accidental threeness generates three separate beings. These are the second intellect and the first, starless sphere which consists of form and matter. The form is soul, in this case the first soul. The second intellect conceives the necessary existence of its own, that of the One and its own contingency as compared to the Supreme Being. This threeness give rise to the forth being, i.e. to the third intellect and the second sphere (that of the fixed stars, which follows the starless sphere) with the second soul. This process goes on in this way giving rise to the intellects from four to ten with the corresponding spheres of Saturn, Jupiter, Mars, the Sun, Venus, Mercury and the Moon. The tenth intellect with the moon-sphere and with its form (i.e. soul) completes the heavenly world².

Ibn Sīnā formulates clearly that the intellect conceiving the necessity of its own existence and that of the Supreme Being generates the

¹ M. Horten, *Die Metaphysik Avicennas*. Halle-New York, 1907, 597-601, etc. Ibn Sīnā, *Kitāb an-nağāt*. Cairo, 1938, 277.

² R. Walzer, *al-Fārābī on the Perfect State*. Oxford 1985, Chapters 4-7, 106-135. Ibn Sīnā, *an-Nağāt*, 262-278.

next intellect and the next soul and conceiving its own relative contingency it generates the matter of the next sphere³.

In this Arabic theory one can detect the basic concepts of the Neoplatonic philosophy: the One, the Intellect and the Soul, respectively. The concepts are identical, but they form different systems in the works of Plotinus and Proclus on the one hand and in that of al-Fārābī and Ibn Sīnā on the other.

In the Neoplatonic philosophy the One generates the Intellect and the Intellect generates the Soul and the Soul emanates the world of sense-perception and the vegetative nature⁴.

There is an obvious difference between the Greek and Arabic account of emanation. This difference is due to the combination of Plotinus and Aristotle in the Arabic cosmology, to begin with. Drawing on the astronomy of his age, first of all on Eudoxus and Kallippos, Aristotle described the Universe in the 12th book of the *Metaphysics* as a system of homocentric spheres. On the basis of the geometric model given in the 8th chapter of the book the movement of the Sun, Moon and planets involves more than three spheres in each case. According to Aristotle's calculation the total number of spheres must be either 47 or 55. In this Universe, apart from the Prime Mover, there are unmoved movers equal in number to the spheres.

V. P. Demidčik asserts that the combination of the above quoted Plotinian and Aristotelian theories served as starting point for al-Fārābī and Ibn Sīnā. al-Fārābī having joined Plotinus and Aristotle modified their cosmology by adding his own views and he elaborated a new cosmology which was taken over and, it must be emphasised, slightly modified by Ibn Sīnā⁵.

³ Ibn Sīnā, *an-Nağāt*, 277.

⁴ Plotini *Enneades*. Paris 1855, 308, 3-5 lines.

⁵ V. P. Demidčik, "Kosmologiya al-Fārābī i iyo osnovnie istočniki". In: *Al-Fārābī, Naučnoe tvorčestvo*. Moscow 1975, 13-30.

R. Walzer tries to throw more light on al-Fārābī's Greek sources in the commentary accompanying his edition of the Perfect State⁶. What he says in essence is that al-Fārābī's cosmology implies the knowledge of the late Greek philosophy. In this connection the commentary is mainly based on Sambursky's book "The Physical World of the Late Antiquity" on the one hand and on the assumption that the text which served as an immediate source for al-Fārābī has been lost, on the other. Ptolemy's *Planetary Hypotheses*, a work preserved completely only in Arabic translation and Simplicius's Commentary on *De Coelo* are the two books referred to on behalf of the Greek literature of that age.

This is everything we know: Aristotle, Plotinus and possibly some obscure Greek works of later date.

II. If we want to get a deeper insight into the problem, we have to consider that the structure of al-Fārābī's works *Ārā' ahl al-madīna al-fādila* and *as-Siyāsa al-madaniyya* is identical with that of Plato's *Ti-maeus*. Both Plato's and al-Fārābī's works mentioned now describe the creation and structure of the Universe. They go on with the same method: first they give a description of the celestial regions and then descend to the world below the moon and describe the things coming to be and passing away. On the top of the earthly existence there are the human beings and the human society the description of which concludes the book of al-Fārābī. In *Ti-maeus* Plato does not mention the human society, though he devotes the last sections of his treatise to the human beings, i.e. after the *makrokosmos* he describes the *mikrokosmos*. *Ti-maeus*, *Ārā' ahl al-madīna al-fādila* and *as-Siyāsa al-madaniyya* belong to the same genre of the philosophical literature.

But there is another work of the same genre which deserves our attention. This is a treatise of the Greek Alexandros of Aphrodisias known only in Arabic version as *Risālat mabādi' al-kull'*. The structure

⁶ R. Walzer, *op. cit.*, 362-378.

⁷ *Aristū 'inda l-'arab*. Ed. A. Badawi, Kuwait 1978², 253-277.

and heading of this treatise are similar to that of the aforementioned books.

The subtitle of al-Fārābī's *as-Siyāsa al-madaniyya*, namely *mabādi' al-mawğūdāt*, rhymes with the title of Alexandros' *mabādi' al-kull* and not only by chance. Alexandros begins discussing the Universe with the Supreme Beings, i.e. with intellects, souls, and describing the heavenly regions he concludes the treatise with the domain of the always changing sublunar world. If we admit that this systematic similarity cannot be ordained by chance, than we should turn to Alexandros next.

Alexandros says that the outermost sphere moves the lower spheres with its circular movement, so it is the source of every movement in the world⁸. Below the first mover which moves the first sphere we find the movers of the second, third, etc. spheres. Alexandros does not define the exact number of the movers, but on the basis of his commentary to Aristotle's *Metaphysics* he seems to have accepted the Aristotelian numbers 47 or 55⁹. Referring to Aristotle he asserts that the movers form a hierarchic order¹⁰. This statement of the *mabādi' al-kull* cannot be corroborated with any quotation from Aristotle, but, nevertheless, the Arab philosophers, too, arranged their movers hierarchically. Alexandros writes that the movement of spheres depends on that of the first sphere and is modified by their own intellect thinking of the first mover. So becomes their movement a circular one¹¹. The different directions of their circular movement are due to the activity of the secondary movers¹².

In an important passage Alexandros writes as follows: In the case of the divine body it is not correct to speak of several movers, even if

⁸ *Op. cit.*, 161.

⁹ *Alexandri Aphrodisiensis in Aristotelis Metaphysica Commentaria*. Ed. M. Hayduck, Berlin 1891, 702, 5 sqq lines.

¹⁰ *Aristū 'inda l'arab*, 267-268.

¹¹ *Op. cit.*, 268.

¹² *Op. cit.*, 266.

we acknowledge that it is correct to say that each one of the orbits has a mover and a longing part¹³. The exact meaning of the terms 'mover' (*muḥarrik*) and 'longing part' (*mutaṣawwiq*) can be cleared up by another passage which reads as follows: We ought to believe that each orbit is animate and has a soul of its own. They make their natural movement by their longing. The nature of these things is the soul, because the form of the divine thing is the most perfect form¹⁴. Speaking of the divine body Alexandros says at the beginning of the treatise that its movement is caused by soul and intellect necessarily. The soul is the form of this body from the beginning. We must not believe that nature of a thing is different from its soul¹⁵.

In the same treatise Alexandros goes on discussing the role of the intellect¹⁶. The essentials of the same idea are summed up in the commentary to the *Metaphysics* as follows: The object of longing is principle of movement... This moves the intellect and the movement of the intellect is observation. The object of longing moves the intellect to observation, thus the object of observation moves the intellect. If the observation, too, moves it and makes it actual intellect, then the object of longing moves it as well, so the object of observation and longing will be the same. The primary object of observation and the intellect by its own nature are identical with the First Cause. Thus the First Cause is the real object of observation and it is the real object of intellection and longing¹⁷.

From these quotations one can gather that, according to Alexandros, all heavenly bodies have an intellect and a soul. The intellect is their mover and the soul is their longing faculty and form.

¹³ *Op. cit.*, 266.

¹⁴ *Op. cit.*, 268, 12 and sqq lines. In French translation: A. Badawi, *La transmission de la Philosophie Grecque au Monde Arabe*, Paris 1968, 132-133.

¹⁵ *Aristū 'inda l-'arab*, 255; *La Transmission*, 123, 13 sqq lines.

¹⁶ *Op. cit.*, 268, 14-270, 9.

¹⁷ *Alexandri ... in Meth.*, 694, 10-15.

These are the main points in the Arabic cosmology as well. Speaking of the form of a sphere as a soul which is longing after the Intellect and the One al-Fārābī and Ibn Sīnā are in harmony with Alexandros.

The two Arab philosophers not only agree with Alexandros but also differ in opinion from him. Alexandros wrote in his scholia to book N of the *Metaphysics* that one can infer from the number of spheres the number of the secondary intellects¹⁸. In Alexandros' opinion there are as many intellects as souls. The number of spheres, it means the orbits, is 47 or 55, consequently, there are 47 or 55 intellects and souls.

Ibn Sīnā says in *Kitāb an-nağāt*, while describing the heavenly regions, that every sphere has a mover (*muḥarrik*) and a longing part (*mutaṣawwiq*)¹⁹. This statement is essentially different from Ptolemy's view quoted by Walzer which, in Simplicius's narration, runs as follows: "It is thus more correct to let each planet be a source of motion, for this is the power and activity of the planets in their proper places and round their own centre, namely the uniform motion in circle"²⁰. Ptolemy derives motion from the inside vital power of the planets as contrasted with Alexandros who derives it from outside intellects. The difference between Ptolemy and the Arab philosophers can be shown by the words quoted from Ibn Sīnā's *Mabda' wa-l-ma'ād*. Ibn Sīnā says in a passage that each planet (*kawkab*) has a sphere in which it has a fixed position (*yubatu fihi*) and by which it is carried (*wa-l-falak yanquluhu*). According to Aristotle it is the sphere and not the planet which revolves round its centre and this is the more likely view, not that of

¹⁸ *Op. cit.*, 794, 12-13.

¹⁹ Ibn Sīnā, *an-Nağāt*, 266.

²⁰ Simplicius, *De coelo. Comm. in Aristotelem Graeca* VII. Ed. I. L. Heiberg, Berlin 1894, 456, 23-27. S. Sambursky, *The Physical World of Late Antiquity*, New York 1962, 142 sqq.

Ptolemy²¹. Walzer's explanation summarized above is thus refuted by the evident contradiction between Ptolemy and the Arab philosophers.

In an interesting passage of *Kitāb an-nağāt* Ibn Sinā refers to the "most correctly speaking man who wrote in his treatise about the principles of the universe that the heaven has only one mover though all spheres have a mover and a longing part of their own". As the texts quoted above and he title prove, this is a plain reference to Alexandros and his treatise under discussion. In the same passage we find another reference to the philosopher "who gives the best abridgment of Aristotle's works without a deeper insight. This philosopher said that the moved thing is not an orbit (*kura*) but a spherical body (*falak*)". And really, if we turn to the Greek philosopher, who became famous for his abridgments of Aristotle's books, i. e. to Themistius, then we find an abridged version of the *Met. A* among his works preserved only in Hebrew translation. In the Hebrew text we find the terms בִּזְרוּקָה and לְהַלְקָה which render the concept of *falak* and *kura* in the section commenting on 1074 a 10-30. Themistius is of the opinion that it is superfluous to move the orbits instead of bodies and everything that is superfluous is unnatural²². Thus the number of movers had been reduced by Themistius from 47 or 55 to 9. It is very likely that this philosophical innovation of Themistius goes back on the astronomical teaching of Hipparchus who changed the course of astronomy by adopting the theory of *epicicles* instead of the Aristotelian spheres²³.

In the same chapter Ibn Sinā reports on Ptolemy's contribution to his cosmology. Ptolemy was the astronomer who added the outermost sphere without stars (*ἀνάστρος σφαῖρα*) to the others described by Aristotle. It is probably the *Syntaxis megalé* that served as a source for the Arabs and not the *Planetary Hypotheses* as supposed by Walzer. At

²¹ Ibn Sinā, *al-Mabda' wa-l-ma'ād*. Ed. Nūrānī. Teheran 1984, 68.

²² *Themistii in Aristotelis metaphysicorum librum paraphrasis*. Ed. S. Landauer. Berlin 1903. Hebrew text 24-25; Latin translation 28, and especially 26, 21-22 lines: "... virtutes moventes tot sunt, quot sunt corpora, quae moventur, ...".

²³ S. Sambursky, *The Physical World of the Greeks*. London 1960², 55-66.

any rate, Ibn Sīnā does not mention the latter work, but he refers to al-Māğiṣṭī both in *Kitāb an-nağāt* and *al-Mabda' wa-l-ma'ād*²⁴.

III. There are other texts, too, which bare witness to our solution of the problem. Nāṣir ad-Dīn aṭ-Ṭūsī names Alexandros and Themistius, instead of describing them, in his commentary to the cosmological section of *al-Iṣārāt wa-t-tanbihāt*²⁵. He refers to Ibn Sīnā's *al-Mabda' wa-l-ma'ād* as the source of his knowledge. And really, in the chapters 25-26 of the first book we find the names of Ptolemy, Alexandros and Themistius with a summary of their contribution to cosmology. In al-Fārābī's cosmology the Aristotelian and Plotinian theory is completed with Ptolemy's outermost starless sphere, with the longing souls of the spheres as their forms in Alexandros's treatise and with the teaching of Themistius who did not interpret the spheres as orbits (*kura*), but as spheric bodies (*falak*) and in this way he reduced their number to 9.

We can thus state that all the Greek texts, which have bearing on al-Fārābī's cosmology, are at our disposal either in Greek original or in Arabic or Hebrew translation.

IV. After having finished the review of texts there is one interesting question to be answered: what was al-Fārābī's scientific achievement if all constituent elements of his cosmology had been invented by Greeks? On the bases of textual evidence we can formulate our answer as follows:

1. al-Fārābī took the part of the Aristotelian school in their controversy with Platonism and Pythagoreanism on the origin of the celestial movement. Ptolemy was an adherent of the Platonic-Pythagorean line. Asclepius, the 6th century Neoplatonic commentator of Aristotle's *Metaphysics* is our best evidence for this controversy²⁶.

²⁴ Ibn Sīnā, *al-Mabda'*, 62; *an-Nağāt*, 267.

²⁵ Ibn Sīnā, *al-Iṣārāt wa-t-tanbihāt*. Ed. S. Dunyā, III. Cairo², 182. *al-Mabda'*, 62.

²⁶ *Asclepii in Aristotelis Metaphysicorum libros A-Z commentaria*. Ed. M. Hayduck. Berlin 1888. 37, 13-18; 35, 19-27, further 37, 16 and 323, 27.

2. In the late antiquity Greek philosophers began to combine the scattered philosophical and astronomical views. Asclepius e.g., who speaks of 9 spheres in his commentary on the Metaphysics united Themistius's concept of spheres (which goes back on Hipparchus) as heavenly bodies instead of orbits with the starless sphere (*ἀνάστρος σφαῖρα*) of Ptolemy. This united theory of Ptolemy and Themistius is a constituent part of the Arabic cosmology, though enlarged with Alexandros's views. al-Fārābī thus continued the activity of the late Greek philosophers carrying on the Peripatetic and Neoplatonic initiations.

3. al-Fārābī's philosophy contains the first cosmological system known to me which, though based on previous Greek theories, offers a new and genuine arrangement of the old material.

4. This cosmology, as it is proved by not very old scholastic textbooks²⁷, transmitted by scholastic philosophers, like Thomas Aquinas, to Europe served as a starting point for Copernicus. He, on the basis of his Platonic conviction, changed the place of the Sun and Earth and supposed that the stars have an inside moving energy²⁸. Through Copernicus the roots of our present day cosmology go back to al-Fārābī.

²⁷ Petri Pázmány, *Tractatus*. Budapest 1897, 22, 52, 65.

²⁸ K. Popper, *Conjectures and Refutations*, New York 1968². 141 and 187.