Corollaries on Space and Time: A Survey of Arabic Sources in Science and Philosophy

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This chapter examines selected theories of space and time in classical traditions in science and philosophy within the history of ideas in Mediaeval Islamic civilization. Reflections on the essence and existence of space and time preoccupied scientific and philosophical thinking since its earliest foundational epochs. The adaptive assimilation, critical interrogation, and innovative expansion of classical Greek traditions in science and philosophy informed the scholarly debates in mediaeval Arabic sources on space and time. Some wondered whether time was altogether nonexistent, while others doubted the reality of its divisibility into parts by arguing that the past ceased to be, that the future does not yet exist, and that the present as a moment/now, which is without magnitude, would not constitute a real part of time. The physical definition of place was also challenged by way of positing place as geometric space. The question concerning the essence and existence of space and time carried significant metaphysical and cosmological entailments that animated the debates between the philosophers (exponents of falsafa) and the dialectical theologians (proponents of kalam). Theological beliefs in the temporal origination of the universe by way of creation and opposing philosophical doctrines of the eternity of the world were also entangled with ontological reflections on the reality of nothingness and the existence of the void, versus the positing of space as a virtual vacuum or a postulated emptiness. Such corollaries on space and time were ultimately central to mediations on divinity when thinking at the “limits of human understanding”.

Prologue

In this survey, I shall present some of the principal theories from Arabic mediaeval sources in the exact sciences and philosophy, regarding the essence and existence of space and time, while I shall also give a succinct account of the main classical Greek traditions that received their adaptive commentaries, solicited their reforming critiques, and inspired their inventive initiation of novel directions in thinking.

Space: Classical Conceptions of Space

The question concerning the reality of space, its specific kind of being and quiddity, has been debated by scholars since the foundational unfolding of philosophical thought. As Aristotle noted in book Delta (IV) of his Physics, numerous classical thinkers endeavored to affirm the existence of place.

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1 It is worth noting from the onset, that this title refers to “Arabic” as the lingua franca of classical traditions in science and philosophy of mediaeval Islamic civilization; it is not meant to indicate that scholarship in this intellectual milieu was primarily and solely associated with the Arabs, given that many thinkers were Persian and Turkish. Moreover, while the majority of the scholars of mediaeval Islamic civilization were Muslim, many others were Christian and Jewish.

2 I have adopted a simplified transliteration system of Arabic terms that does not include full vocalizations with diacritical marks.
(topos), but Plato was perhaps the first amongst them to systemically inquire about its essence. The Platonic reflections on the quiddity of spatiality were principally gathered in the dialogues of the Timaeus in reference to what is named by the Greek appellation khôra (chora), which is customarily translated in several modern European languages as: space, espace, or Raum. Nonetheless, the notion of spatiality, as that which is akin to extension, or to the isotropic and homogeneous conception of mathematical space, does not squarely correspond with what is intended by the signifier khôra; rather, translation involves in this regard some sort of semantic and representational transformation, while it also points to historical developments in the unfolding of the concept of space.

As it was ambiguously relegated to us by Plato (on the authority of the narrative of the Pythagorean astronomer, Timaeus of Locri), it is said that khôra is a “third genus” (triton), besides being and becoming, which is in itself neither intelligible nor sensible. As a “receptacle”, this “boundless” khôra receives all becoming entities without taking on the character of what it contains. It is therefore amorphous and characterless. Moreover, like the forms (eidoi), it is everlasting and does not admit of destruction. These ambivalent propositions concerning the reality of khôra may have indeed constituted the earliest systemic philosophical and metaphysically-oriented reflections on the nature of “spatiality” in the context of Ancient cosmology and classical physics.

Based on Aristotle’s endeavor to define “place” (topos), it was reductively conjectured that Plato’s khôra referred to prime matter. However, this exegesis served the purposes of the Aristotelian conception of “place” as a mode of containment by envelopment, more than that it resulted necessarily from a faithful and attentive reading of Plato’s Timaeus. After all, Aristotle rejected the theories that posited place as being the form (eidos), the matter (hulê; partly following his own interpretation of Plato’s khôra), or the interval (diastêma) between the extremities of the body that it contains. He rather defined topos as “the innermost primary surface-boundary of the

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4 Plato, Timaeus, 50B-51A.

5 Plato, Timaeus, 52A-B.

6 Aristotle, Physics, IV, 212a 3-5. For this paper, translations taken from Aristotle, Physics, ed. W. David Ross (Oxford: Oxford University Press, 1936).