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Al-Kindi's "The Real One": Considerations of a mathematician or of a metaphysician?

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ABSTRACT: The aim of the article is to analyze Al-Kindi's concept of the True (Essential) One and certain additional issues, also taking into account the influence on his position from both classical philosophy and source texts of Islam. In the opening part of the article, Al-Kindi's innovative approach to the application of mathematics in research in other areas of knowledge is discussed. In the next part, attention is devoted to the classification of science, as well as to the purpose of practicing metaphysics, which is to seek answers to questions about the first, fundamental causes. Subsequently, the question of how to predicate on unity and multiplicity is raised. In the following parts of the article, The Real Unity (its characteristics and way of existence) is analyzed, as well as the influence of the Qur'an and traditional Islamic theology on the position of Al-Kindi. The considerations lead to the conclusion that Al-Kindi undoubtedly "mathematized philosophy", and especially metaphysics. Moreover, in his view, the unity in things cannot cause things to exist; the cause must "come from outside". Such a statement is a sort of (indirect) argument in favor of the theistic thesis and creationism, which leads to the recognition of Al-Kindi as both a philosopher and a philosophical apologist of the religious tradition.

KEY WORDS: Al-Kindi, Islam, mathematics, metaphysics, number theory, philosophy.

1. Introduction

In the history of science, as well as in the history of philosophy, there have been certain cases when mathematics and philosophy came closer to each other, and where they have sometimes also interpenetrated each other. The point here is not only that some prominent mathematicians

were also philosophers, as in the modern era (in the West), for instance, R. Descartes, G. W. Leibniz, B. Bolzano, B. Russell, and A. Whitehead.[1] Sometimes – it seems not very often – philosophical views also resulted from (or at least were inspired) by knowledge in mathematics.

One of the most interesting figures in the history of science, active in the period that came after the end of the heyday of Greek and Hellenistic thought, was the Arab mathematician and philosopher Abu Yusuf Ya'qub ibn 'Ishaq Al-Sabbah Al-Kindi (ca. 800–870 CE).[2] A detailed discussion of his place in the history of science and, above all, his impact on the development of mathematics and philosophy in Arab-Muslim culture, is beyond the scope of this article. It should be mentioned, however, that he worked with scholars who translated works of Aristotle and other Greek philosophers, as well as the works of Greek mathematicians, into Arabic. Being a polymath, Al-Kindi dealt with most of the fields of knowledge of that time, significantly contributing to the development of some of them. In addition to mathematics and philosophy, these areas of knowledge include statics, optics, logic, medicine, pharmacology, astronomy, musicology, climatology, zoology, and geography. He wrote many works, of which only some have survived to this day (cf. Adamson 2007: 3).

One of the essential problems of philosophy, and especially of metaphysics, is the unity–multiplicity relationship. We are used to seeing the universe as one, but we experience multiplicity over and over in our everyday experience of the world, too. Does multiplicity, then, come from unity, and if so, how is it even possible? Is unity somehow "more essential" ("more fundamental", "more primal") than multiplicity? These and similar questions and doubts had already appeared in classical philosophy.[3] "The Philosopher of the Arabs", as Al-Kindi was called, was an Aristotelian, so it should come as no surprise that he was interested in the question of the first (single) cause by which all the elements of the world around us (i.e., multiplicity) exist. Nevertheless, along with the question about the first cause, Al-Kindi raised further, no less important questions. Among them are the following: Is the first cause God, and how does real (essential) unity exist?

[1] And, in the classical period, Thales, Anaximander, and Pythagoreans, for instance.

[2] For Al-Kindi's biography cf., for instance, Ivry 1974: 3; El-Elhany 1962: 421; Abu Rida 1950: 1; Al-Tarihi 2009.

[3] In classical philosophy, for instance, in Plato, Plotinus (Neoplatonism in general), as well as in Aristotle; in modern times, for example, in Spinoza; cf., for instance, Berti 2001: 185; Mukhopaddhyaya 2002.

The aim of this article is to analyze Al-Kindi's concept of the True (Essential) One and certain additional issues in the field of philosophy (especially metaphysics). Particular attention should be devoted to the following questions: To what extent did his mathematical knowledge influence his position in the field of metaphysics? Did Al-Kindi "mathematize" philosophy, and especially metaphysics, and if so, with what result? Also, when analyzing the concept of the True One, is it enough to examine its very content – or should we additionally take into account certain cultural, social, and religious aspects, too? Perhaps the concept of the True One can be properly and fully understood only when the influence of a culture dominated by certain ideas of religious provenance (in this case, Islamic), in their specific form and at a specific historical moment, is taken into consideration?

2. Al-Kindi as a mathematician

Along with another prominent scientist of that era, Al-Khwarizmi, Al-Kindi contributed to the popularization of Indo-Arab numerals, which were subsequently adopted not only in Arab-Muslim culture, but also around the world. As a mathematician, Al-Kindi was also interested in issues such as relative values and the rules of multiplication or unity, as seen from the perspective of number theory (cf. Dodge 1970: 617–619; Micheau 2004: 985–1007).

Al-Kindi influenced the development of geometry the most. In his works on geometry he dealt with a discussion of Euclid's views (which he corrected), issues related to polyhedrons, the method of measuring the diameter of a circle based on its circumference (developed by Archimedes), issues related to the division of a square and a triangle, a discussion of the apparent movements of celestial bodies in the sky using geometric concepts and methods, as well as certain issues related to the design of measuring instruments, such as an astrolabe and a sundial. In geometry, he also dealt with the theory of parallel lines, as well as with the possibility of calculating an azimuth on a sphere. Furthermore, he was interested in mapping space on a plane. Based on the *Almagest* of Ptolemy and the *Commentary* of Theon of Alexandria (which had already been translated into Arabic at that time), Al-Kindi was the first scholar of the Islamic world to deal with isoperimetric problems. In addition, in his works on spherical geometry, Al-Kindi presented the view that the universe has the shape of a sphere, and that all celestial bodies, as well as the celestial vault, are spherical.

Al-Kindi not only practiced mathematics, but also considered it to be a model science. In this way he anticipated, to some extent, the views of Descartes, who regarded only mathematics as science, and aimed at mathematizing nature and natural sciences. Al-Kindi introduced mathematics to medicine and pharmacology. As P. Prioreschi notes, his

> most important writing [...] devoted to medicine [...] is *De Gradibus*, an extraordinary work in which, in an original way, departing from the previous tradition, he tries to apply mathematics to pharmacology. [...] Al-Kindi was the first [...] to attempt to introduce serious quantification into medicine (Prioreschi 2002: 18).

Al-Kindi's significant contribution to the beginnings and development of cryptology is also worth mentioning. With his research, he clearly anticipated the achievements of Leon Battista Alberti (1404–1472), a prominent representative of Italian Renaissance humanism, who was considered to be the father of Western cryptology. As D. Kahn writes, cryptology was born among Arabs who were the first to discover and describe the methods of cryptanalysis (cf. Kahn 1967: 93).[4] Al-Kindi was one of the first cryptologists to use the achievements of Al-Khalil, the founder of Arabic lexicography who was also interested in cryptography and cryptanalysis. Al-Kindi's treatise on cryptanalysis is the oldest work on the subject that has survived to our times. By dealing with cryptology, Al-Kindi provided, for example, a classification of the encryption systems of the time. He also contributed to the creation and development of combinatorial analysis. He was the first to develop a method of breaking the so-called Caesarean code (or Caesar's shift), a mono-alphabetic substitution cipher, already used in antiquity, probably in the correspondence of Julius Caesar. Al-Kindi used for this task frequency analysis, a method consisting in examining the frequency of occurrence of a given character (or a group of characters) in the encoded text, which in turn was possible thanks to his linguistic knowledge. It is likely that Al-Kindi's careful analysis of the text of the Qur'an led to the conclusion that certain letters of a given alphabet occur with a certain frequency in writing (cf. Kahn 1967: 80).

3. The purpose and method of metaphysics

Al-Kindi significantly influenced the development of mathematical sciences, but – like many in history, especially in ancient times, and also later, in the Italian Renaissance – he was also interested in many differ-

[4] Cf. also Meer Alam 2003: 27.

ent fields of knowledge. According to him, science should be regarded as a system of various fields of knowledge, related to each other. In this system we are dealing with a clearly established hierarchy. Al-Kindi's classification of science takes into account the stages of education: All disciplines should be studied in a specific order, taking into account the gradually increasing complexity of their subjects. We should start with the mathematical sciences: first with arithmetic, then with geometry, astronomy, and finally musicology. After studying mathematics, we should study works on logic, then get acquainted with metaphysics, and finally with works on morality; remaining knowledge is derived from the aforementioned. So, apparently, mathematics would be the starting point for scientists, although it would not necessarily be the point at which they ultimately aimed (cf. Al-Jubouri 2004: 202).

The fact that Al-Kindi was a philosopher who appreciated mathematics very highly is evidenced by some of the titles of his unpreserved works such as *Risala fi annahu la tanal al-falsafa illa bi-'ilmi al-riyadat* (Arab. *Treatise that philosophy is available only through knowledge of mathematical sciences*; cf. Jolivet 2004: 1009). According to him, anyone studying philosophy is faced with the task of learning mathematics, or only left with the possibility of imitating philosophy and learning philosophical statements by heart (Rashed 2008: 156).

Compared to the classical period, Arab-Muslim philosophy of Al-Kindi's times was dealt with under completely different cultural and social conditions. The difference resulted mainly from the nature of the dominant religion (i.e., Islam), which was the factor that most strongly shaped the ways of reasoning, and which clearly influenced research interests. The philosophers of the Islamic world did not operate in an intellectual vacuum. The Qur'an was considered the Book that not only contained knowledge derived directly from the Creator, but that also contained a sort of philosophical material. For example, philosophers such as Al-Kindi, living in Islamic societies, could not question the world being created by God, nor could they treat being itself (i.e., that which is, what exists) as limited just to material things (substances). Therefore, when one aims to analyze the concept of Al-Kindi's True, or Essential One, attention should be devoted not only to the inspiration of classical philosophy – for instance, certain ideas taken from Aristotelianism, Platonism, and Neoplatonism – but also to the influence of Islam (cf. Janssens 1994: 4–16).

According to Al-Kindi, in philosophy, the most important is metaphysics, "the first philosophy" according to Aristotle and his followers.

The Arab author devotes much attention to this area in his most important preserved work on philosophy, *Kitab fi al-falsafa al-ula* (Arab. *Book on First Philosophy*, Abu Rida 1950: 81–162).[5] Only the first part of this work, consisting of four chapters, has survived to the present day, and the preserved fragments are probably only half (or slightly less) of the original text. Al-Kindi also discusses important metaphysical issues in other, smaller works, such as *Risala fi al-fa'il al-haqq al-awwal at-tam wa al-fa'il an-naqas alladhi huwa bi-al-majaz* (Arab. *Treatise on the True, Complete, Sole Subject of Action, and on Imperfect Subject of Action, Which Is Itself* [i.e., *Subject of Action*] *Only Metaphorically*, Abu Rida 1950: 180-184), *Risala fi idah tanahi jirm al'alam* (Arab. *Treatise on Explaining the Limited Nature of the World Body,* Abu Rida 1950: 185-192) and others. His work, *De quinque essentiis* (Lat. *About the Five Essences*), which has only survived in the Latin translation (Nagy 1897: 28-40), should also be mentioned.

The aim of metaphysics, as Al-Kindi believed, is to seek answers to questions about the first, fundamental causes, and especially questions regarding the cause of existence as such – which forms the highest kind of knowledge. As he wrote,

> the noblest and highest in philosophy is the first philosophy, that is, the knowledge of the First Truth [Arab. *al-haqq al-awwal*]. Accordingly, the perfect and noblest philosopher will be one who fully possesses this noblest knowledge; […] because knowledge of a cause is nobler than knowledge of the effect of an action (Abu Rida 1950: 101).

It is worth noting that both of the terms appearing in the original text – specifically *al-haqq* and *al-awwal*, "the truth" and "the first (one)" – are also, from the point of view of Islamic theology, attributes of God.[6]

As a being endowed with intellect, man should wonder why there is something rather than nothing. Such considerations lead, according to Al-Kindi, to the concept that there is a first (single) cause for everything that exists. It is also, at the same time, the first cause of movement and all change (cf. Abu Rida 1950: 143). This cause, which should not be surprising, is identified with the God of Islam. In Al-Kindi's philosophy it leads to the conclusion that the world is created and, contrary

[5] Only the first part of this work, consisting of four chapters, has survived to the present day. The preserved fragments are probably only half (or slightly less) of the original text (cf. Adamson 2007: 46, 215).

[6] In the Qur'an, God has ninety-nine "most beautiful names" (Arab. *al-asma' al-husna*), namely Divine attributes, which He does not share with anyone or anything else. For Al-Kindi referring to God's attributes, cf. Adamson 2003: 49–57. Cf. also Gilliot 2007: 176–182.

to Aristotle's assertion, not eternal (cf. Staley 1989: 355–370). This also means that in its existence, every being is completely dependent on The Creator (cf. Adamson 2003: 57-66).

As already mentioned, according to Al-Kindi, metaphysics should be performed using a method that is appropriate for it. Such a method has nothing to do with experiencing with one's senses. As he writes,

> we should […] pursue what is required for each type of inquiry, and not apply probability in the mathematical sciences; nor make reference to sense data or exemplification in the science of metaphysics; nor to a conceptual generalization with regard to the principles of the science of physics; nor to prove in rhetoric […]. Indeed, if we adhere to these conditions, what we have set ourselves in the study will become an easy goal for us to achieve. However, if, on the other hand, we resist it, we lose the purpose of our efforts and it becomes difficult for us to know what we intended (Abu Rida 1950: 111–112).

In other words, metaphysics is about what is beyond nature [Arab. *al-ashya 'alladhi fawqa at-tabi'a*], and it should not be based on mental representations of things. On the contrary, according to Al-Kindi, in metaphysics it is necessary to concentrate on the activity of the (pure) reason and the rules of logic. In one of his works, he even writes that "many of those who sought knowledge of things beyond nature were confused when, like children, they used the reflection of [things] in the soul in their research, by analogy to the usual way of gaining knowledge based on the senses" (Abu Rida 1950: 110).

4. Unity and multiplicity

In metaphysics, as well as in the field of speculative theology, Al-Kindi mainly tried to clarify some of the most important points, especially the nature of God and the way God exists. He also strived to describe God's relationship to the world which of course was associated (analogically to what was presented in Aristotle's philosophy) with thinking of God as of the first cause. According to Al-Kindi, considerations of these issues cannot even begin without prior, general analysis of unity and multiplicity. These initial studies takes place in the area shared by mathematics (number theory) and philosophy, which means a type of certain common area of research for both of these areas of knowledge.

Referring to the unity–multiplicity relationship, in his *Kitab fi al-falsafa al-ula*, Al-Kindi gives certain arguments to prove that the first and the smallest number is *two*, and that *one* cannot be considered a number at all, because it is a number just "homonymously" (Abu Rida 1950: 146-

152). The same arguments may be found earlier in Aristotle's *Physics*.[7] This element of Al-Kindi's philosophy was, nonetheless, also influenced by the Neoplatonic tradition. After all, it was the Neoplatonists who were postulating the existence of The One, which was understood as the source of everything, totally transcendent of all beings (Ivry 1974: 172).[8]

Al-Kindi seems to be particularly interested in the question of how to predicate on unity and multiplicity. He refers to this issue in the initial fragments of the third chapter of his *Kitab fi al-falsafa al-ula*, which, along with the fourth chapter, contains a presentation of the author's metaphysical position (cf. Abu Rida 1950: 126–127). As Al-Kindi writes,

> let us now consider [...] how we proclaim unity [Arab. *kam naw' yuqal al-wahid*]. Now, we affirm that unity is predicated upon every whole having some permanent nature [Arab. *muttasil*], and also about what has not received multiplicity. Therefore it is pronounced of the kind [Arab. *al-jins*], the form [Arab. *al-sura*], individual being [Arab. *al-shahs*], specific difference [Arab. *al-fasl*], property [Arab. *al-has*] and about accidental features [Arab. *al-'ard*] (Abu Rida 1950: 126-127).

In addressing these issues, Al-Kindi continues the considerations previously undertaken by Porphyry in his *Isagoge* (cf. Barnes 2006), a work which was already functioning in the form of an Arabic translation at that time. It is in this work that the categories mentioned by Al-Kindi were listed.[9]

According to Al-Kindi, when we speak of unity in relation to the objects of the world around us, we often speak of something that is singular, but only in relative terms. This is analogous to when we speak of size or length. In other words, we are then dealing with a unity which is in some way connected with a multiplicity, not with a pure (true, genuine, essential) unity. In other words, something that seems to be singular in combination with something else – for instance, a class of similar objects – should no longer be treated as a unity in the strict sense. For example, when talking about an animal, one can mean both a single animal and a certain species. Moreover, each specific animal is also a sum of its parts (e.g., limbs, organs). It is worth noting that such a view is firmly entrenched in Aristotle's *Metaphysics*. In Book V of his

[7] As Aristotle writes, "the smallest number in the strict sense of the word is *two*" (Aristotle, *Physics*, IV 12 220a, Koutrouby and Rattiner 2017).

[8] Especially Ivry's comment to 128.11. For the similarities between the passages of Chapter III of Al-Kindi's work and Plato's *Parmenides*, cf. Ivry 1974: 175–177, and especially Ivry's comment to 132.15.

[9] It is worth mentioning that these terms were also defined by Al-Kindi in his *Treatise on Definitions* (cf. Abu Rida 1950: 163-179).

Metaphysics, the Stagirite writes: "*One* means either what is singular accidentally or what is singular by itself. [...] What is unity is such either by number, or by species, or by kind, or by analogy."[10] The topic of different kinds of unity, as well as how unity is spoken of, is also mentioned by Aristotle in Book X of his *Metaphysics*.[11] The thoughts expressed there were developed by Al-Kindi on the pages of his most important work in the field of philosophy, the previously mentioned *Kitab fi al-fasafa al-ula*, where the Arab philosopher writes, for example, that in speaking of one kind, of one species, of a single property (feature) of an object, and so on, we find each time that it is a unity which is spoken of only conventionally. Therefore, it cannot be called the true (essential) unity. According to Al-Kindi, it is also the case when we speak about specific difference, about everything [Arab. *al-jami'*], about the whole [Arab. *al-kull*], or about *parts* [*al-juz'*], each time our utterance concerns a unity which is not an essential unity. In other words, it would always be the unity which is interconnected with multiplicity (Abu Rida 1950: 126–127).

As Al-Kindi believed, a property which is spoken of both in relation to a certain type and in relation to each individual entity belonging to that kind, in a way is also a multiplicity [Arab. *kathira*] because it exists in many individual beings [Arab. *mawjuda fi ashhas kathira*]; moreover, it is related to variability, and variability is divisible, namely it is not *one* (Abu Rida 1950: 130–131). In his *Kitab fi al-falsafa al-ula* Al-Kindi writes:

> Unity is [...] spoken of in case of all predicates mentioned […]. As for the genus, it is in each of its species […], while the species is in each of its individual entities […]. An individual being is one (single) also only by convention, because every individual thing is divisible, and therefore it is not essentially a unity (Abu Rida 1950: 128).

What does not belong to the essence of a thing is only accidentally in it, and what appears in a thing only accidentally exists because of something other than itself. As Al-Kindi writes, "what appears incidentally is the effect [...] and the effect comes from the cause. It is therefore necessary to recognize that the unity which exists in individual beings is the effect of an action of a cause" (Abu Rida 1950: 128). If, therefore, we speak about any element of the phenomenal world we experience, it will always be unity related to multiplicity. As Al-Kindi states,

> [...] it is impossible with regard to these things [...] that they possess unity without multiplicity [Arab. *kathira bi-la-wahida*]. [...] It is therefore necessary that all

[10] Aristotle, *Metaphysics* V.6 1016a (Reeve 2016).
[11] Cf. Aristotle, *Metaphysics* X.1-3 (ibid.).

> the things we have mentioned should be simultaneously many and one [Arab. *kathira wa wahida*]. [...] It remains, then, to recognize that unity is connected with multiplicity; that is, it is related to it in all sensually-perceived objects [Arab. *fi jami al-mahsusat*] and in everything that has to do with these objects – in such a way that whatever contains unity, contains in itself also multiplicity, and whatever contains multiplicity, contains in itself also unity (Abu Rida 1950: 140).

In the world around us, therefore, we find neither genuine (essential) unity, nor genuine (essential) multiplicity; they are always unity and multiplicity which are apparently associated with each other. As noticed later in these considerations, such a position was important not only for the very understanding of the unity–multiplicity relationship, but above all for Al-Kindi's metaphysics and speculative theology, and above all for his understanding of the relationship between God and the world He has created.

5. The Real (Essential) Unity – its characteristics and way of existence

In Al-Kindi's proclaimed metaphysics, the True Unity (the True One) is regarded as the cause of all beings and is absolutely unique, existing in a way that is incomparable to anything else. It is the only thing which is eternal and singular in the perfect, essential way.

The very core of Al-Kindi's views is not entirely original. His position combines philosophical (Aristotelian and Neoplatonic) threads with religious, Islamic content. It is firmly established in classical Greek philosophy, which the Arab scholar became acquainted with through translations. In Aristotle's thought Al-Kindi found the concept of the First Mover, the first cause of all change (all movement).[12] In addition, the Stagirite, in his work *On Heaven*, as well as in his *Physics*, mentions the indestructible nature of what is eternal.[13] In the fourteenth chapter of his *Metaphysics* he writes that what is eternal does not need any cause for its existence. In these passages, Aristotle also maintains that what is first and eternal is at the same time self-sufficient.[14] Having become acquainted with the Arabic translation of *Metaphysics*, which also strongly influenced many other philosophers of the Islamic world, Al-Kindi found

[12] In his *Physics*, the Stagirite writes that "it is better to recognize one factor of movement rather than many [...]", and that "in the light of the following [...] arguments, it will turn out that the first factor of movement must be something that is one and eternal" (cf. Aristotle, *Physics* VII: 6 259a, ibid.).

[13] Aristotle, *Physics* VIII.5 257a-258b, ibid.

[14] Cf. Aristotle, *Metaphysics* XIV: 4 191b, ibid.

in Aristotle such a metaphysics which could be reconciled with requirements of Islamic theology – proclaiming (in the Qur'an) the existence of The True [Arab. *al-haqq*], The One [Arab. *al-wahid*], The First [Arab. *al-awwal*], The Incomparable [Arab. *al-badi'*] and The Eternal [Arab. *al-samad*], and Divine Creator [Arab. *al-mubdi', al-khaliq*] (cf. Gilliot 2007: 176-182).

Apart from Aristotelianism, Al-Kindi's idea of the True One was also influenced by other schools of classical philosophy, especially by Platonism and Neoplatonism. Regarding the influence of the former, the Platonic dialogue *Parmenides* should be mentioned. The analogies are clearly visible here: in his famous dialogue, the Athenian author refers to ideas previously expressed by the Eleaths, namely Xenophanes and Parmenides, who were teaching about the Oneness, or the One, beyond which there is nothing but sensual illusions. Plato describes it as existing "in itself and at the same time in something else (in other things)", also as having no parts, and not being moved or changed in any way; as something which is not identical to anything else (cf. Meinwald 1991).

The influence of Neoplatonism on Al-Kindi's metaphysics was also significant. First of all, in formulating his philosophical views, Al-Kindi strongly relied on a pseudo-Aristotelian work known as *Theology of Aristotle* (Arab. *Athulujiya Aristu*), which was a paraphrase of parts of Plotinus' *Enneads* along with Porphyry's commentary. There, the idea of the Creator regarded as the First Being and the True One, as well as the cause of existence of all other beings, both immaterial and material, was presented (cf. Hozien 2005: 119–120; Kraye 1992: 478–484).[15] As Plotinus wrote: "[…] There must be something before all things, something single and different from all things [...]; it must exist only thanks to itself, not being mixed up with things [...], and on the other hand it must have the power to be present in other things."[16] When mentioning the influence of Neoplatonism on the metaphysics of Al-Kindi, it should also be emphasized that his ideas were also strongly related to the concepts of Aristotle's commentators from the so-called second neo-Platonic school of Alexandria: Ammonius Saccas, Elias of Alexandria, and John Philiponus (cf. Ivry 1974: 116, Wildberg 1990: 33–51). In addition to Plotinus, Al-Kindi was also inspired by another Neoplatonist, Proclus, or more precisely, by *The Book of Pure Good*, which

[15] Cf. also D'Ancona 2004: 159–176. For original Arabic text of *Aristotle's Theology*, cf. Badawi 1955.

[16] Plotinus, *Enneads* V: 4 1 (Kalligas 2014).

was an Arabic paraphrasing of his work (cf. Izdebska 2009: 5–48; Dodds 1933 108–110)[17]. It was Proclus from whom Al-Kindi took the idea that "all beings come from one first cause."[18] According to Proclus, true unity does not participate in multiplicity: "If, then, The One [...] does not participate in the multiplicity in any way, the multiplicity will be secondary to it in all respects and will participate in The One, but The One will not participate in multiplicity."[19] In chapter VI of *The Book of Pure Good* we read: "The first cause is elusive [for our understanding]. And words are not enough to define it [...], because it is above every cause, and it can only be determined by the second causes, which are illuminated by the light of the first one."[20]

In Al-Kindi, too, the True One, its uniqueness and the way it exists, are not fully expressible. The consequence of this is that he engages in so-called negative (or apophatic) theology, which main method is not to say what God (the Supreme Being) is, but what He is *not*. Many Christian philosophers and theologians were representatives of apophatic theology; this includes, for instance, Clement of Alexandria, Pseudo-Dionysius Areopagite, Basil the Great, Gregory of Nyssa, Gregory of Nazianzus, and John of Damascus. The tradition of negative theology was continued in Muslim thought by numerous theologians representing the so-called *kalam*, namely the unorthodox current of Islamic speculative and discursive theology. In this connection, special attention should be paid to the Mutazilites of the eighth and ninth centuries AC, Al-Nazzam and Abu Al-Hudhayl Al-'Allaf, for instance.

According to Al-Kindi, the True One is not only perfectly singular, but also eternal. A definition of the eternal [Arab. *al-azali*] is given by Al-Kindi in his *Kitab fi al-fasala al-ula*, as well as in his other works (cf. Abu Rida 1950: 113, 169). As he writes, "what has never been non-existent is eternal; that what is eternal has no existential 'before'; the continuance of what is eternal is not due to anything else; what is eternal has also no cause [Arab. *la 'illa lahu*], that is anything because of which it exists" (Abu Rida 1950: 113).

In Al-Kindi's most important philosophical work, numerous examples of this type of theoretical approach are given. All of them are based on the belief that the True (Essential) One should not be compared

[17] For the original Arabic text, cf. Bardenhewer 1822, 58–118
[18] Proclus, *The Elements of Theology* 11 (Dodds 1933).
[19] Ibid. 5.
[20] Ibid.

with anything else, both in terms of its attributes and its unique way of existence. When speaking of the True One, one should not relate it to anything else, nor compare it to anything else, for the True One does not belong to any species or kind. The True One also does not decrease or increase, because increasing and decreasing are always related to multiplicity; neither is it divided in any way, nor is it moving; it does not undergo any change. As the Arab philosopher writes:

> The True One has [...] neither matter, nor form; neither quantity, nor quality, [...] it cannot be described by reference to any sensual forms, it does not belong to any kind, nor does it have a species difference, […] property, […] or motion, is it also not determined by any of those things which have no real unity [Arab. *la wahidan bi-al-haqiqa*]; but it is pure unity, unity itself – that is, it has nothing but unity, while everything else has [always] multiplicity [of some sort]. […] The True One has unity through the nature of that which is in no way divisible […] (Abu Rida 1950: 161).

According to Al-Kindi, the cause of unity and multiplicity in things must be transcendent to those things (different and distinct from them), for if it were to be assumed to be an immanent cause, "it would be part of it – and that part would be primal to the rest of the things" – and this, in turn, would lead to absurdity (cf. Abu Rida 1950: 141). Rather, it must be assumed that the cause precedes the effect. According to the Arab philosopher, this cause is "more brilliant, nobler and primal to them [to the things]. […] This cause is not associated with things [with ordinary beings] because […] to be connected requires the existence of a cause that is transcendent to those things which are connected" (Abu Rida 1950: 141). True (essential) unity and, on the other hand, accidental unity – which is a unity only metaphorically, or only by name – are clearly separated and distinguished in Al-Kindi's thought. As he writes,

> what appears in things accidentally comes [...] from something other than that very thing [...]; and we are dealing here with the acquisition of an accidental property coming from a giver [of that property [...]; and the effect comes from the acting cause. [...] The unity which in fact only occurs accidentally comes from that in which the unity is essential. Hence the true unity which is necessarily *not* the product of any cause (Abu Rida 1950: 141–142).

It is worth emphasizing that in Al-Kindi's metaphysics these considerations are synonymous with a kind of argument (or "proof") of reason not so much for the existence of God in the traditional, religious understanding, but rather for the existence of the First Cause ("God of philosophers"), which here is identified with the True (Essential) One. As can easily be seen, there is a clear philosophical kinship between Al-

Kindi and Aristotle. This is especially true if we take into account the role and place of the metaphysical considerations of the latter concerning the (finite) chain of causes and effects, which in the Stagirite system serves as a logical proof for the existence of the First Mover [Gk. *ὃ οὐ κινούμενον κινεῖ*, Lat. *primum movens*], namely the first un-caused cause.

6. Religious and cultural context – the influence of Islam

A key element of Al-Kindi's metaphysics is his assertion that "it is impossible for anything to give rise of its own essence [Arab. *dhat*]" (Abu Rida 1950: 123). The fact that things exist at all (their existence) and the fact that they are as they are (their essence) must depend on some external factor. As Al-Kindi writes, "the cause of existence and continuance of all things is [the] True One, because everything that has existence exists in truth. The True One necessarily exists, and therefore all beings [Arab. *anniyat*] exist" (cf. Abu Rida 1950: 97).

But Al-Kindi does not end there. Like his Christian predecessors in the field of philosophy, he draws profusely from the rich legacy of classical philosophy, adding what was not contrary to religious (Islamic) content to his own thought system. He reinterprets Greek philosophy (or more precisely, reinterprets Aristotelianism through the prism of Neoplatonic commentaries) in a religious spirit, identifying the True One with God, which the Qur'an speaks of.

The very terminology that Al-Kindi uses indicates that his philosophy is strongly rooted in Islam. The Real One [Arab. *al-wahid al-haqq*] is just two of the previously mentioned "most beautiful names of God" [Arabic. *al-asma 'al-husna*] of Qur'an, or God's attributes. Both of these attributes *(al-wahid* and *al-haqq*) can be found in the Qur'ran many times, for instance in the following fragments: Qur'an 6:62, 10:30, 18:44, 22: 6, 31:30 (God as Truth, Arab. *al-haqq*); Qur'ran 2: 163, 4: 171, 5:73, 9:31, 16:51 (God as One, Arab. *al-wahid*; cf. Yusuf Ali 2021).

Taking into account the original Arabic text of the Qur'ran, it is worth emphasizing that there are two terms referring to God being The One: *Al-Wahid* (Arab. The One) and *Al-Ahad*, which may be translated as The Unique (The Incomparable), or The Only One, The Indivisible.[21] *Al-Ahad* is the One who is absolutely unique in his Oneness, and also someone who does not share his divinity with anyone. God is The One, therefore, not only in the numerical sense, but also in the sense that there are no "partners" with Him, which has clear and obvious implications in

[21] For the Islamic perspective on monotheism cf., for instance, Philips 2005: 17–41.

the field of theology (and religion in general). Fundamentally speaking, both terms have the same or very similar meaning, except that *Al-Wahid* emphasizes the Oneness of God perhaps even more. The first of the mentioned terms may be found, for example, in surah *Saad*:

> Say [O Prophet]: "I am only a warner. And there is no [other] god 'worthy of worship' except Allah - the One [*Al-Wahid*], the Supreme. (Qur'an 38:65)

While the second of these terms may be found, for instance, in surah *Al-Ikhlas*:

> Say [O, Prophet]: "He is Allah - The One and Indivisible [*ahad*]; Allah – The Eternal, The Absolute; [...] And there is none comparable to Him. (Qur'an 112:1-4)

The existence of God and His attributes have always been the core of Islamic theology. Many verses of the Qur'an addressed issues related to the existence of God, His attributes, and the dependence of the world (or actually worlds, together with all creatures inhabiting them) on the Maker. As a well-educated representative of the Arab-Muslim elite, Al-Kindi was aware of the fact that the key issue in Islam has always been *tawhid* (strict Islamic monotheism), in religious terms, which is a prerequisite for being saved by God on Judgment Day, as well as for beings saved from the punishment of Gehenna.[22]

Tawhid's opposite is *shirk*: "associating partners with God" (which, according to Islam, He obviously does not have) or "assigning equal to Him". In Islam, *shirk* means the denial of the oneness of God and is, in short, the only sin (as well as a mistake in reasoning) that God will *not* be willing to forgive. *Shirk*, or polytheism, can appear in many forms, including assigning God's attributes (or the aforementioned "most beautiful names"), such as The One, to anyone or anything but God Himself. Given this, it should come as no surprise that in his metaphysical considerations Al-Kindi, a religious Muslim, pays so much attention to what is absolutely unique and perfectly singular, namely, to True Oneness. Proving its existence (and, secondly, proving – against Aristotle – that the world is not eternal, which would contradict Islamic creationism) is undoubtedly the central theme of his *Kitab fi al-falsafa al-ula*. The fact that in his metaphysical investigations he focused so heavily on these issues, explains why in the medieval Arab-Muslim culture his most important philosophical work was also known as *Kitab at-tawhid* [Arab. *Book of Monotheism*].

[22] For polytheism (*shirk*) in Qur'an and hadiths, cf., for instance, ibid., p. 43–57.

All this means that by using methods and terminology drawn from the philosophical tradition, Al-Kindi seeks to defend (or to proclaim an apology for) Islam, focusing in particular on the absolute foundation of Islamic theology, *tawhid*. In his view, the cause of the existence of all things, namely the True One, does not resemble things in any way, and at the same time is infinitely more perfect than them. So when it comes to Al-Kindi's metaphysics, it is safe to assume that we find in it certain concepts that are a kind of repetition of the truths previously revealed in the Qur'an, but with the use of strictly philosophical terms and methods. Having said that, it is also worth emphasizing that at the same time Al-Kindi was not a theologian in the strict sense of the term. In Arab-Muslim culture, what we call theology was most often dealt by Islamic scholars (*"ulama"*), specialists in Islamic law and jurisprudence (*fiqh*), who were members of circles to which he did not belong. In Al-Kindi's times, however, it was also dealt by so-called Mu'tazilites, specifically representatives of one of the main currents of Muslim unorthodox discursive theology, known as *kalam*. For some time, the Mu'tazilites gained considerable political influence in the Abbasid empire, then anti-Mu'tazilite opposition gained the advantage. Al-Kindi felt the effects of these changes personally: he was arrested and beaten on the orders of the authorities, also his (by then famous) book collection was confiscated (cf. Kamal 2003: 27–34; Jamali 2021: 71–96). Clearly, the discussions around certain theological issues went far beyond the circles of specialists, and directly influenced the course of affairs in the state. Among these, the most important issue was whether the Qur'an should be assumed to be God's created or uncreated word. If we were to assume that it was an uncreated word of God, some argued, it would lead to the assumption that something (in this case, the Book) shares with God one of his attributes (in this case, eternal existence); and yet this cannot be done, because it would lead to *shirk*, polytheism. Al-Kindi, too, reasoned in this way: if we assume that whatever shares with God even one of his attributes – in his metaphysics it was being perfectly One – that would mean assigning partners or companions to God.

It is hard not to notice that Al-Kindi's considerations on unity and multiplicity went beyond just number theory, reaching the area of philosophy and theology. Therefore, he made his intellectual contribution to the various discussions that took place in his time in the rapidly developing Arab-Muslim culture, recently enriched with translations containing the wisdom of the "ancients" [Arab. *Al-qudama*], especially that of the Greeks and their philosophy. The author of *Kitab fi al-falsafa*

al-ula not only took an active part in introducing these teachings to his culture, but also – or, perhaps, most of all – tried to prove that these teachings (especially philosophy) were not essentially contrary to Islam. To this end, he focused on the unity–multiplicity relationship, stating that the elements of the world around us – being not perfectly, essentially singular – owe their unity and their existence to The True Unity, namely God, whom the Qur'an and hadiths were also mentioning.

7. Conclusions

The study of Al-Kindi's metaphysics reveals that the True One he was speaking of was the key issue. Some additional issues related to philosophy (especially metaphysics) and mathematics (especially number theory) were part of this discussion. Al-Kindi paid special attention to what somehow connected the area of mathematics with philosophy, namely differences between unity and multiplicity, as well as the differences between "essential unity" and that which is unity "only metaphorically", or just by name. For him, "essential unity" was the actual cause of unity in things, as well as the cause of their existence. Non-essential unity, on the other hand, should be regarded as the unity in things. According to Al-Kindi, such unity is always, in some way, "contaminated" with multiplicity of different sorts (belonging to certain a class of things, consisting of different parts etc.).

The unity in things cannot cause these things to exist, because the cause must "come from outside" (in the metaphysical meaning), namely must be transcendent. Moreover, this means, Al-Kindi argued, that we must accept the existence of essential unity: something that gives things its unity and "allows" them to exist. Without this transcendent, ideally singular, cause none of these things (ordinary beings) that surround us would exist. In other words, all those things cannot by themselves create ("pass on to themselves") their unity and their existence. Thus, the metaphysics of Al-Kindi, despite the complicated conceptual apparatus inherited from Aristotle and his Neoplatonic commentators from late antiquity, did not differ substantially from the world view to be found in the verses of the Qur'an.

It is worth considering whether the philosophical concept of the True One was just a continuation of Al-Kindi's deliberations in the field of mathematics, or was it otherwise? It seems that the Arab philosopher accepted this idea *a priori*, and only tried to "find" sufficiently strong theoretical foundations for it. He found them firstly in classical phi-

losophy (especially in Aristotelianism and Neoplatonism), and secondly in number theory, and more precisely in the considerations concerning the difference between unity and multiplicity. The answer to the question why Al-Kindi adopted the concept of the True One at all is quite obvious. He was a Muslim believer, convinced of the rightness of his religion, and placed special emphasis on the unique and incomparable existence and attributes of God. Among these attributes he found such as *Al-Wahid* or *Al-Ahad* – the One and Only (Creator), incomparable to anything else, on whom the existence of anything else is completely dependent. Therefore, when analyzing Al-Kindi's True One, it is not enough to study the idea itself. Additionally, we should take into account the cultural context, in this case the religious one, in particular. Such a context means contemplating the unique character of Arab-Muslim culture in the period when the scientific and philosophical achievements of earlier cultures – especially of that of the Greeks, with their philosophy – had become thought that Arab-Muslim culture was acquainted with.

However, could Al-Kindi's metaphysics and his philosophical idea of God have arisen in this form at all, if the Arab Philosopher were not a mathematician? Probably not. Does this mean, however, that Al-Kindi sought some kind of "mathematization of metaphysics" (and, possibly, other fields of knowledge)?

According to modern researchers, this was exactly the case (Tahiri 2014: 87). As noted by Rashed, for instance, the Arab author referred to *The Elements* of Euclid as both a method and a model for the "mathematization of metaphysics," by proclaiming that what is interesting from the point of view of metaphysical considerations, as well as what is given in Divine revelation, can also become a subject of scientific research and meet the requirements of a geometric proof. Mathematical research – the geometric proof, for example – thus became, in a way, an instrument of metaphysics.

This kind of mathematical approach to metaphysical questions is easy to find in *Kitab fi al-falsafa al-ula*, the most important philosophical work of Al-Kindi. There, he first presents the definitions of simple terms, which he uses in further proving, then presents the premises, and finally the proof itself, relying on the *reductio ad absurdum method*, which was also used in geometry by Euclid. Al-Kindi also uses *more geometrico* approaches in his other philosophical works, for example in *Risala fi ma'iya ma la yumkin an yakun la nihaya [lahu] wa ma alladhi yuqal la nihaya lahu* [Arab. *A Treaty on the essence of what cannot exist forever and on what is*

said to be endless; Abu Rida 1950: 193-198). Here, too, he conducts his considerations in a very systematic way, beginning by formulating the premises, and then going on to investigate the fundamental question: if a finite fragment of it is taken from infinite space, will what remains be finite or infinite? Eventually, Al-Kindi concludes that both hypotheses lead to absurdity, which in turn implies that the universe is not infinite.

The fact that Al-Kindi "mathematized philosophy", and especially metaphysics, should not raise any doubts. Dealing with philosophy and introducing it to the Arab-Muslim culture, Al-Kindi not only wanted to present his philosophical position, but also wanted to support it on the most solid foundation possible. For him, such a foundation, in addition to the tradition of Greek philosophy, was mathematics.

Al-Kindi remained a Muslim believer focused on defending creationism (against Aristotle), as well as the Islamic teachings on God and His attributes – especially the belief that the Creator cannot be compared to his creation. Because of that, it is probably best to look at Al-Kindi in a slightly different way than has been mostly done in studies devoted to the history of ideas: not only as the brilliant polymath of his time, and the initiator of Arab and Muslim philosophy, but also as a religious apologist seeking to prove his own religion right by using the complicated theoretical and conceptual apparatus, which had been partially inherited from "the ancients".

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