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IBN SĪNĀ ON PROVING CAUSALITY

HANNAH C. ERLWEIN
Max Planck Institute for the History of Science, Berlin
Email: hannah.erlwein@gmail.com

Abstract. Ibn Sīnā famously opens *The Metaphysics* (*Al-ilāhiyyāt*) of *The Healing* (*Al-šifāʾ*) with a discussion of what constitutes the subject matter of that science. Several candidates are introduced and subsequently dismissed, before "the existent *qua* existent" is identified as its subject matter. Among the candidates dismissed, he mentions "the ultimate causes for all existents, the four of them" (which are, however, things investigated [*maṭālib*] in this science). Here, Ibn Sīnā comes to problematise the notion of causality itself. He is adamant that "the existence of causes for things which are effects" is not self-evident, but needs to be proven by the metaphysician by means of a "demonstrative clarification" (*bayān burhānī*). He explains why sensation (*ḥiss*) and experience (*taǧriba*) cannot prove causality, before turning to its metaphysical proof. In this article, I investigate what Ibn Sīnā thought this "demonstrative clarification" of causality is. I present an analysis of his train of thought and a commentary on the various points he makes, leading up to his proof of causality. These points touch on problems of psychology, scientific method, and scientific proof, and can be unpacked by taking into account explanations he offers elsewhere.

Résumé. Ibn Sīnā ouvre *La Métaphysique* (*Al-ilāhiyyāt*) de *La Guérison* (*Al-šifāʾ*) par une discussion sur ce qui constitue le sujet de cette science. Plusieurs candidats sont présentés puis écartés, avant que «l'existant en tant qu'existant» ne soit identifié comme son sujet. Parmi les candidats écartés, il mentionne «les causes ultimes de tous les existants, les quatre» (qui sont pourtant des choses étudiées [*maṭālib*] dans cette science). Ibn Sīnā vient ici problématiser la notion même de causalité. Il insiste sur le fait que «l'existence de causes pour des choses qui sont des effets» ne va pas de soi, mais doit être prouvée par le métaphysicien au moyen d'une «clarification démonstrative» (*bayān burhānī*). Il explique pourquoi la sensation (*ḥiss*) et l'expérience (*taǧriba*) ne peuvent prouver la causalité, avant de se tourner vers sa preuve métaphysique. Dans cet article, j'étudie ce qu'Ibn Sīnā pensait de cette «clarification démonstrative» de la causalité. Je présente une analyse de son cheminement de pensée et un commentaire sur les différents points qu'il avance, menant à sa preuve de la causalité. Ces points touchent à des problèmes de psychologie, de méthode scientifique et de preuve scientifique, et peuvent être analysés en tenant compte des explications qu'il propose ailleurs.

1. INTRODUCTION

Turning to Ibn Sīnā's *magnum opus*, *Al-šifāʾ* or *The Healing*, we find that the book on metaphysics, *Al-ilāhiyyāt*, opens with a discussion of what constitutes the subject matter (*mawḍūʿ*) of that science. Several candidates are introduced and subsequently dismissed, before "the existent insofar as it is an existent" is identified as the subject matter of metaphysics.[1] Among the candidates dismissed, Ibn Sīnā mentions "the ultimate causes for all existents, the four of them."[2] He notes that these are assumed to be the subject matter of metaphysics by certain people, but explains that the four Aristotelian causes are just some of several things investigated (*maṭālib*) in this science.

At this point Ibn Sīnā problematises the notion of causality itself (*al-ʿilliyya … bi-mā hiya hiya*[3]). He does so in a fairly short passage, which is, however, dense with considerations. His problematisation of the notion that there are "causes for the things having causes" runs deeper than, say, the investigation of how many types of causes there are (answer: four) or whether all causes precede their effects in time (answer: no).[4] The *Šifāʾ* is unique among Ibn Sīnā's works in problematising causality itself. He is adamant that causality is not a self-evident matter and cannot be taken for granted. It consequently requires proof – that is, from the perspective of the metaphysician, whose science is at the top of the hierarchy of theoretical sciences; the lesser sciences can take causality for granted. The proof of causality must be nothing less than a "demonstrative clarification" (*bayān burhānī*), thus offering the highest degree of certainty within Ibn Sīnā's system of scientific reasoning.[5] To be sure, his aspiration is not to provide a psychological or epistemological *explanation* of how we humans come to hold the conviction that there are effects and causes. He occasionally touches on this question as well – but the task he sets for himself within metaphysics is to provide a scientific *justification* and *proof* of causality.[6]

[1] Ibn Sīnā, *Al-ilāhiyyāt min Al-šifāʾ = The Metaphysics of The Healing: A parallel English-Arabic text, translated by Michael E. Marmura* (Provo, Utah, 2005), p. 9, § 11. Quotations from this work are based on Marmura's translation with some modifications on my part.

[2] Ibn Sīnā, *Al-ilāhiyyāt*, p. 5, § 13.

[3] Ibn Sīnā, *Al-ilāhiyyāt*, p. 12, § 19.

[4] Ibn Sīnā, *Al-ilāhiyyāt*, p. 5, § 16.

[5] Ibn Sīnā, *Al-burhān min Al-šifāʾ = Al-burhān*, ed. ʿAbd al-Raḥmān Badawī (Cairo, 1966), p. 7, 37. On Ibn Sīnā's theory of science, compare Riccardo Strobino, *Avicenna's Theory of Science: Logic, Metaphysics, Epistemology* (Oakland, California, 2021).

Let us now turn to the passage I have mentioned. I quote it in full, but divided into units in order to facilitate following the train of thought:

> Also, knowledge of the absolute causes comes about after knowledge that causes are affirmed for things which have causes. For as long as we have not affirmed the existence of causes for things which are effects, by establishing that the latter's existence is connected with what precedes them in existence, it does not become necessary for reason that there exists an absolute cause or that there exists some cause.
>
> As for sensation, it only leads to concomitance. But it is not the case that, if two things are concomitants, one of them must be the cause of the other.
>
> The persuasion which occurs to the soul due to the multiplicity of what sensation as well as tried and tested experience convey is not certain – as you [student of metaphysics] know – unless it is known that the things which exist are, for the most part, natural or voluntary.
>
> But this depends, in truth, on affirming causes and acknowledging the existence of causes. This, however, is not evident and primary, rather it is commonly held – and you have come to know the difference between the two. Nor is it the case, even if it comes close to being self-evident to the mind that originated things have some principle, that this must be self-evident. This is exemplified by many geometrical problems which are demonstrated in Euclid's book.
>
> The demonstrative clarification of this does then not belong to any other science, and it must consequently take place in this science.[7]

[6] This is similar to the distinction between discovery and justification in science, where certain ways of discovering a fact might not suffice to justify it. Compare Carl R. Kordig, "Discovery and Justification," *Philosophy of Science*, 45 (1978), p. 110–117. In what follows I disregard the role of the Active Intellect in bringing about knowledge in humans. I only focus on the content of the proof. On the role of the Active Intellect, see Herbert A. Davidson, *Alfarabi, Avicenna, & Averroes, on Intellect: Their Cosmologies, Theories of the Active Intellect, & Theories of Human Intellect* (New York, Oxford, 1992), p. 83–102; Jon McGinnis, "Avicenna's Naturalized Epistemology and Scientific Method," in Shahid Rahman, Tony Street, and Hassan Tahiri (eds.), *The Unity of Science in the Arabic Tradition: Science, Logic, Epistemology and their Interactions* (Dordrecht, 2008), p. 129–152, esp. p. 143–144.

[7] Ibn Sīnā, *Al-ilāhiyyāt*, p. 5–6, § 16.

In what follows, I investigate what Ibn Sīnā thought this "demonstrative clarification" of causality is. I present an analysis of Ibn Sīnā's train of thought and a commentary on the various points he makes as he addresses himself to a student of metaphysics in the passage above, leading up to his proof of causality. These points touch on problems of psychology, scientific method, and scientific proof, and can be unpacked by taking into account explanations he offers elsewhere.

It should also be pointed out that Ibn Sīnā's proof of causality in the *Metaphysics* of the *Healing* has not received the attention it deserves in the literature. While this work has certainly received a lot of attention, the literature has focused instead on questions such as the difference between the four causes, the essence-existence distinction, or the proof of God's existence as the necessarily existent in itself.[8] These issues are certainly all major concerns of the *Metaphysics*, but the significance which Ibn Sīnā himself attaches to taking a step back and establishing, on a more fundamental level, that there is such a thing as cause and effect has been overlooked.[9] Its significance is not least that without certainty about "the existence of causes for things which are effects," the whole scientific enterprise as envisioned by Ibn Sīnā is impossible. This is because scientific knowledge means, in the ideal case, deducing insights from demonstrations, where the middle term provides the cause or reason why something is the case. It is thus worth that we study his proof of causality.

[8] See, for example, firstly, Robert Wisnovsky, "Final and efficient causality in Avicenna's cosmology and theology," *Quaestio*, 2 (2002), p. 97–123 and Michael E. Marmura, "Avicenna on Causal Priority," in Parviz Morewedge (ed.), *Islamic Philosophy and Mysticism*, p. 65–83 (Delmar, 1981); secondly, Parviz Morewedge, "Philosophical Analysis and Ibn Sīnā's 'Essence-Existence' Distinction," *Journal of the American Oriental Society*, 92 (1972), p. 425–435 and Robert Wisnovsky, "Notes on Avicenna's Concept of Thingness (*shayʾiyya*)," *Arabic Sciences and Philosophy*, 10 (2000), p. 181–221; thirdly, Peter Adamson, "From the necessary existent to God," in Peter Adamson (ed.), *Interpreting Avicenna: Critical Essays* (Cambridge, 2013), p. 170–189 and Toby Mayer, "Ibn Sīnā's *Burhān al-ṣiddīqīn*," *Journal of Islamic Studies*, 12 (2001), p. 18–39.

[9] Amos Bertolacci alludes in passing to Ibn Sīnā's proof of causality, but is interested instead in his discussion of the subject matter of metaphysics: "… because such a consideration of the ultimate causes presupposes the proof of their existence – something that neither sensation nor any of the other sciences except metaphysics can provide;" Amos Bertolacci, *The Reception of Aristotle's* Metaphysics *in Avicenna's* Kitāb al-shifāʾ*: A Milestone of Western Metaphysical Thought* (Leiden, Boston, 2006), p. 121.

2. SENSATION AND CONCOMITANCE

> As for sensation (*ḥiss*), it only leads to concomitance (*muwāfā*). But it is not the case that, if two things are concomitants, one of them must be the cause of the other.

On his quest for the proof of causality, Ibn Sīnā opens by apparently anticipating an objection which the student of metaphysics might raise: Don't we *observe* causal connections between things all the time? What else should be required to prove them?

Ibn Sīnā disagrees. The impressions conveyed to us by our five external senses do not include the causal relations between things. He postulates this in passing, apparently expecting that committed students will recall his various works on psychology, which they would have studied before turning to metaphysics. In those works, Ibn Sīnā described how the external senses convey impressions to the internal senses of the animal soul. The sense of sight – which would presumably be considered the one most relevant for discerning causal connections between sensible things – perceives a material body together with certain accidents which necessarily attach to it, such as "quantity, quality, place, and position" as well as "shape [and] colour."[10] This explains why, for Ibn Sīnā, sense impressions do not – and cannot – include causal relations between things. Causal relations are different from the material forms of things, and consequently do not fall under the domain of the senses. Proximity can indeed be perceived by the senses, but it is not tantamount to causality.

The fallacy of confusing proximity with causality would already have been evident to the student of metaphysics from studying Ibn Sīnā's works on logic. She would recall that proximity can also exist in cases where we know there is no causal connection. Ibn Sīnā raised this point, for instance, in the *Book of Demonstration* of the *Healing*, book I, chapter 7, when he explained that the *burhān al-inna ʿalā al-iṭlāq*, the absolute demonstration-that, lays open two concomitant effects which both result from a single cause. The example he gives, in proper syllogistic form, is of a person whose urine is cloudy and who is, therefore, suspected to have encephalitis. One symptom entails the other, but it is not its cause. Rather, both are concomitant effects of a single cause, which he subsequently identifies as the movement of heated humours towards

[10] Ibn Sīnā, *Kitāb al-nafs min Al-naǧāt = An English Translation of Kitāb al-najāt, Book II, Chapter VI with Historico-Philosophical Notes and Textual Improvements on the Cairo Edition by F. Rahman* (Westport, 1981 [reprint of 1952]), p. 38–39.

the head.[11] Knowing of this sort of phenomenon would have made it clear to the student of metaphysics that proximity is not identical with causality, and that the proof of causality can therefore not be founded on sensation.

3. EXPERIENCE AND CAUSATION

> The persuasion which occurs to the soul due to the multiplicity of what sensation as well as tried and tested experience (*taǧriba*) convey is not certain – as you know – unless it is known that the things which exist are, for the most part, natural or voluntary.
>
> But this depends, in truth, on affirming causes and acknowledging the existence of causes.

The student might at this point raise another question, and it is this question which Ibn Sīnā seems to anticipate when he now turns to the theme of tried and tested experience. The student would remember from Ibn Sīnā's works on logic that experience is a method of establishing causal connections between things. In the *Book of Demonstration* of the *Healing*, Ibn Sīnā explained:

> Experience is when someone sees or observes that [several] things of one and the same kind are followed by the occurrence of a given action and a given affection. If this happens repeatedly, many times, reason comes to judge that this is due to the essence of the thing, and does not occur to it by chance, for what is by chance does not occur always. An example of this is our judgement that "the magnet attracts iron," and that "scammony purges bile." … It is as if experience were a combination of induction based on the senses and a rational syllogism based on the difference between what is essential and what is accidental. For what is accidental, does not happen always.[12]

Remembering these remarks, the student might ask why experience, having its starting point in sensation but also entailing a rational el-

[11] Ibn Sīnā, *Al-burhān min Al-šifāʾ*, p. 32.

[12] Ibn Sīnā, *Al-burhān min Al-šifāʾ*, p. 161–162. More generally on *taǧriba*, compare Jon McGinnis, "Scientific Methodologies in Medieval Islam," *Journal for the History of Philosophy*, 41 (2003), p. 307–327; Jules L. Janssens, "'Experience' (*tajriba*) in Classical Arabic Philosophy (al-Fārābī – Avicenna)," *Quaestio*, 4 (2004), p. 45–62.

ement, cannot provide the proof sought by the metaphysician. In fact, this is precisely what Ibn Sīnā now negates. Experience undoubtedly can provide the natural philosopher with good reasons to judge that the attraction of iron is *caused* by the magnet's nature, and the physician to judge that scammony *causes* purging of bile. Experience allows them to judge that these phenomena do not accidentally occur together, as concomitants.[13] But Ibn Sīnā now reminds his student that the natural philosopher and the physician are only justified in their claims because the things they investigate by means of experience are natural (*ṭabīᶜiyya*) or voluntary (*iḫtiyāriyya*).

Having previously studied Ibn Sīnā's works on physics, the student would be quick to grasp what he hints at here. In the *Physics* of the *Healing*, we are told that natural things are so called because they have a nature (*ṭabīᶜa*), which is defined as a principle of their motions and actions. Nature is the efficient cause (*fāᶜil*) that brings about the various activities of natural things. The activities caused by a thing's nature adhere to a single, uniform course, which occurs involuntarily (such as our examples of scammony purging bile and the magnet attracting iron). But there are also things which act and move voluntarily. Their principle is either the celestial soul or the animal soul. The former gives rise to a uniform course of motions (as in the planets' eternal circular movement), while the latter gives rise to a variety of different motions (for example, when humans and other animals move in different directions at different times). This is the difference between natural and voluntary things.[14]

Remembering this, the student of metaphysics would come to realise the following: The physician and natural philosopher can reveal causal connections through experience precisely because they know that they are operating in the realm of natural and voluntary things, which are within the domain of causality. Their task simply consists in establishing whether or not a causal connection obtains between certain things.[15]

[13] Ibn Sīnā stipulates certain conditions under which these insights are valid, e. g. that they only apply to scammony "in our region," since it is conceivable that "scammony in some other region has a different mixture or special characteristics … which cause it to fail to purge [bile];" Ibn Sīnā, *Al-burhān min Al-šifāʾ*, p. 46, 48.

[14] Ibn Sīnā, *Al-samāᶜ al-ṭabīᶜī min Al-šifāʾ = The Physics of The Healing, a parallel English-Arabic text translated, introduced, and annotated by Jon McGinnis* (Provo, Utah, 2009), p. 37–38. Quotes from this work are based on McGinnis's translation with occasional modifications on my part. The fourth principle is the vegetative soul, but it is not relevant for us as it is neither natural in the sense of having a nature nor voluntary (producing instead various involuntary motions).

[15] This is despite the fact that "[c]oncerning issues involving volition, however, it is difficult to produce the cause completely, for the will is incited to act [only] after

The student would then also come to realise something else: Nature, the celestial soul, and the animal soul are but particular principles and manifestations of causality. They exist in the domain of physics, but not in all sciences. In physics, they are posited ("We set it down as a posit, which the natural philosopher accepts … , that the bodies … are moved only as a result of powers in them"[16]), but their being posited implies that "the existence of causes for the things which are effects" has already been accepted when turning to the science of physics. Ibn Sīnā's short remark on experience in the *Metaphysics* reminds the student that this method cannot prove causality, since it assumes causality.

4. COMMONLY HELD AND PRIMARY MATTERS, AND ORIGINATED EFFECTS

> But this depends, in truth, on affirming causes and acknowledging the existence of causes. This, however, is not evident (*bayyin*) and primary (*awwalī*), rather it is commonly held (*mašhūr*) – and you have come to know the difference between the two.
>
> Nor is it the case, even if it comes close to being self-evident (*bayyin bi-nafsihi*) to the mind that originated things have some principle, that this must be self-evident.
>
> This is exemplified by many geometrical problems which are demonstrated (*al-mubarhana ʿalayhā*) in Euclid's book.

The student of metaphysics would at this point have understood that experience, like sensation, cannot be an adequate basis to justify the assumption of causality. Ibn Sīnā now appears to anticipate yet another question which the student might raise. Perhaps, she might interject, causality does not require proof at all, perhaps it is a self-evident matter? It is this assumption which Ibn Sīnā now sets out to reject.

He avers that "the existence of causes" is something "commonly held" (*mašhūr*). On the one hand, this evaluation is a statement about the – obvious – ubiquity of people's belief in causality, but on the other, *mašhūr* must be read as a technical term within Ibn Sīnā's scientific system. He juxtaposes it with two other technical terms, being "evident" (*bayyin*) and being "primary" (*awwalī*). He then addresses the student of meta-

a number of factors are fulfilled, the enumeration of which is not easy;" Ibn Sīnā, *Al-samāʿ al-ṭabīʿī*, p. 105.

[16] Ibn Sīnā, *Al-samāʿ al-ṭabīʿī*, p. 39.

physics, reminding her that "you have come to know the difference between the two." Once more, her familiarity with his works on logic would allow her to decipher these rather short remarks.

She would recall that, in the *Book of Demonstration* of the logical part of the *Healing*, Ibn Sīnā distinguished different classes (*ṣinf*) of premises that can be used in syllogisms. He lists 14 such "principles of syllogisms," as he calls them, dividing them according to their epistemic origin. His list contains, for instance, premises derived from sensation (*maḥsūsāt*), from tried and tested experience (*muǧarrabāt*), and from frequently transmitted reports (*mutawātirāt*). It also includes the commonly held matters (*mašhūrāt*) and primaries (*awwaliyyāt*) alluded to in the *Metaphysics*.[17]

Propositions such as "justice is good and injustice is evil" or "thanking the benefactor is obligatory," Ibn Sīnā explains in the *Book of Demonstration*, are examples of commonly held matters.[18] They may be accepted as true by a certain group, by a whole community, or by the practitioners of different arts – but what propositions of this class have in common is that they are accepted *without* proof of their truth. Consequently, Ibn Sīnā points out, commonly held propositions may be true or not, "and there are true ones among them, [but] with a subtle condition which the masses are not conscious of, and it is also not unlikely that there are false ones among the commonly held propositions."[19] As long as doubt persists over the truth or untruth of such propositions, they fall short of the Avicennan ideal of certainty in science. For the practitioner of science, a syllogism constructed from commonly held premises is merely dialectic (*ǧadalī*), giving only the appearance of certainty (*šabīh al-yaqīn*).[20] Commonly held propositions which are

[17] Ibn Sīnā, *Al-burhān min Al-šifāʾ*, p. 16–21. These are discussed in detail in Dimitri Gutas, "The Empiricism of Avicenna," *Oriens*, 40 (2012), p. 391–436.

[18] Ibn Sīnā, *Al-burhān min Al-šifāʾ*, p. 19.

[19] Ibn Sīnā, *Al-burhān min Al-šifāʾ*, p. 19. In fact, Ibn Sīnā would not have subscribed to the black-and-white statement that justice is good and injustice evil. Goodness consists in the attainment of a perfection, and so he describes injustice as a good *in relation to* the irascible power of the animal soul, whose nature lies in seeking dominance. See Hannah C. Erlwein, "Ibn Sīnā's Moral Ontology and Theory of Law," in Peter Adamson (ed.), *Philosophy and Jurisprudence in the Islamic World* (Berlin, 2019), p. 29–51, esp. p. 30–33.

[20] Ibn Sīnā, *Al-burhān min Al-šifāʾ*, p. 4. Compare also Ibn Sīnā, *Al-ilāhiyyāt*, p. 13, § 21: Metaphysics yields certainty, while dialectics merely yields conjecture (*ẓann*). On Ibn Sīnā's treatment of the commonly held premises in the *Dialectics* (*Al-ǧadal*) of the *Šifāʾ* (i. e. at book I, chapter 8), see Ibn Sīnā, *La Dialectique: Livre I du Kitāb al-ǧadal, introduction, traduction, annotation et commentaire de Fouad Mlih* (Paris,

actually true "require proof (*ḥuǧǧa*) in order to become certain (*yaqīn*)." The proof reveals the cause or reason why (*sabab*) a proposition can be accepted as true.[21] Only then can a syllogism constructed from them yield certainty.[22] From the perspective of the masses, the insistence of the practitioner of science on removing any doubt about the truth or untruth of such propositions may be irrelevant. The masses do not operate in the realm of science. For them, such commonly held propositions may prove "useful in practice."[23]

Commonly held matters are very different from evident and primary ones. Concerning the latter two types, which belong in one category, there is no doubt about their truth. The reason, Ibn Sīnā explains in the logical part of the *Salvation*, is that "primaries are matters and premises that come about in humans through their intellectual faculty, without any cause bringing about assent to them other than their essences."[24] Unlike commonly held propositions, which may or may not be true and which require a proof to establish their truth, primaries are true, and their truth is known instinctively, as it were, to humans, without the need to produce a cause or reason that renders them true. Ibn Sīnā frequently mentions propositions such as "the whole is greater than the part" as examples.[25] The proposition that "there is no intermediary between affirmation and negation" he considers "the most primary of all true propositions."[26] All that is required to assent to the truth of such propositions is to intellectually grasp the concepts involved, the "essences," as he has it. Not requiring any sort of explanation (*bayān*) in the form of a cause revealing that some predicate is actually true of some subject, primaries are "self-evident" (*bayyin bi-nafsihi*) and certain.[27] A

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[21] Ibn Sīnā, *Al-burhān min Al-šifāʾ*, p. 37.

[22] Ibn Sīnā, *Al-burhān min Al-šifāʾ*, p. 19.

[23] Seyed N. Mousavian and Muhammad Ardeshir, "Avicenna on the Primary Propositions," *History and Philosophy of Logic*, 39 (2018), p. 201–231, p. 220, quoting from the logical part of Ibn Sīnā's *Danesh-name Alai*.

[24] Ibn Sīnā, *Al-manṭiq min Kitāb al-naǧāt = Al-naǧāt*, edited by Muḥyī al-Dīn al-Ṣabrī al-Kurdī (Cairo, 1938), p. 64. A more comprehensive analysis of primaries has been provided by Mousavian and Ardeshir, "Primary Propositions;" Michael E. Marmura, "Avicenna on Primary Concepts in the *Metaphysics* of his *Al-shifāʾ*," in Michael E. Marmura, *Probing in Islamic Philosophy: Studies in the Philosophies of Ibn Sīnā, al-Ghazālī and Other Major Muslim Thinkers* (Binghamton, 2005) [reprinted].

[25] Ibn Sīnā, *Al-burhān min Al-šifāʾ*, p. 17.

[26] Ibn Sīnā, *Al-ilāhiyyāt*, p. 39, § 2.

[27] Ibn Sīnā, *Al-burhān min Al-šifāʾ*, p. 44. Ibn Sīnā points out that "it might happen that the learner fails to conceive the primary propositions in [his] intellect in the

syllogism constructed from primary premises consequently also yields certainty.[28]

Being fully aware of the different classes of propositions, the student of metaphysics would understand what Ibn Sīnā alludes to in his statement that "the existence of causes … is not evident and primary, rather it is commonly held."[29] For him, the claim that "[there are] causes for things which are effects" belongs to the class of propositions which, in the absence of proof, might be true or not.[30] It is not a proposition whose truth forces itself on us as does that of the proposition "the whole is greater than the part"[31] – or so says Ibn Sīnā, though he adds a caveat: "Nor is it the case, even if it comes close to being self-evident to the mind that originated things have some principle, that this must be self-evident."[32] This caveat is that some things appear self-evident to our mind, or rather come close to appearing self-evident – but their appearing so does not imply that they actually *have to* be so (*laysa … yağib*). Our conviction that originated things, which enter existence after non-existence, require some principle (*mabdaʾ mā*) is an example of this. Ibn Sīnā does not explain at this point how it is that our mind might almost come to regard as evident something which in truth is not evident. He might, however, implicitly refer us to his works on logic.

There, he talks about the estimative faculty (*quwwa wahmiyya*), one of the internal senses of the animal soul. This faculty has several activities, one of which is forming judgements such as "every existent must be extended in space."[33] Even though that judgement is found among the majority of people, Ibn Sīnā points out, it is actually false (for there are, of course, immaterial entities). Estimation may commit the mistake

beginning … either because of an existent flaw in his natural disposition (*fiṭra*) or a flaw that has emerged due to an illness, old age, or confusion caused by accepted and widely-held opinions … or he might not understand the words [involved in a primary proposition];" Ibn Sīnā, *Al-burhān min Al-šifāʾ*, p. 59. Mousavian and Ardeshir introduced the idea of Ibn Sīnā's "Ideal Man" (in analogy to the "Flying Man" thought experiment) to underscore the epistemological conditions for grasping primary premises; Mousavian and Ardeshir, "Avicenna," p. 210–214.

[28] Ibn Sīnā, *Al-burhān min Al-šifāʾ*, p. 38: "It is certain because its two premises are universal and necessary and there is no doubt about them."

[29] Ibn Sīnā, *Al-ilāhiyyāt*, p. 6, § 16.

[30] Ibn Sīnā, *Al-ilāhiyyāt*, p. 5, § 16.

[31] Ibn Sīnā, *Al-burhān min Al-šifāʾ*, p. 17.

[32] Ibn Sīnā, *Al-ilāhiyyāt*, p. 6, § 16.

[33] Ibn Sīnā, *Al-burhān min Al-šifāʾ*, p. 18. On estimation, see Deborah L. Black, "Estimation (*wahm*) in Avicenna: The Logical and Epistemological Dimensions," *Dialogue*, 32 (1993), p. 219–158.

of extending a judgement about *sensible* entities to *all* entities. But estimation also forms judgements which are correct, such as "two bodies cannot be imagined in a single place."[34] When the judgements arrived at by estimation are presented to reason, "then reason (*al-ʿaql*) engages in the sort of investigation which is characteristic of it, and composes syllogisms … and it comes to know that [estimation] was wrong"[35] or "[in the case of] true [judgements], reason embraces them."[36]

Ibn Sīnā's explanations imply that reason's task of sifting true estimative judgements from false ones is not necessarily a straightforward, uncomplicated process, requiring us instead to construct syllogisms from premises that derive from sources other than estimation. This task is further complicated by the fact that "estimative judgements (*wahmiyyāt*) … are initially not distinguishable from the primaries (*awwaliyyāt*) belonging to the intellect; they resemble each other."[37] The resemblance is that humans initially find it just as impossible to doubt certain estimative judgements as to doubt primary propositions.[38]

We might want to read these remarks as the background against which, in the *Metaphysics*, Ibn Sīnā maintains that some things – such as the dependence of originated things on some principle – come close to being self-evident to the mind. He does not say so explicitly, but we might want to place the judgement "every existent must be extended in space" on a par with the judgement "every originated thing has some principle," in terms of the role of estimation in arriving at them. Even though such judgements do not, strictly speaking, belong to the class of primaries, which are in fact evident to reason, it initially appears to reason that they are members of that class – until reason engages in investigating them.

Warning the student of metaphysics to beware of this fallacy, Ibn Sīnā now makes recourse to another luminary, no less authoritative than himself. After stating "Nor is it the case, even if it comes close to being self-evident to the mind that originated things have some principle, that this must be self-evident," he adds: "This is exemplified by many geometrical problems which are demonstrated in Euclid's book." Taking

[34] Ibn Sīnā, *Al-manṭiq min Kitāb al-naǧāt*, p. 62.
[35] Ibn Sīnā, *Al-burhān min Al-šifāʾ*, p. 18.
[36] Ibn Sīnā, *Al-manṭiq min Kitāb al-naǧāt*, p. 62.
[37] Ibn Sīnā, *Al-manṭiq min Kitāb al-naǧāt*, p. 62.
[38] Ibn Sīnā, *Al-manṭiq min Kitāb al-naǧāt*, p. 62. On the role of the natural disposition (*fiṭra*) in this, see Frank Griffel, "Al-Ghazālī's Use of 'Original Human Disposition' (*fiṭra*) and its Background in the Teachings of al-Fārābī and Avicenna," *The Muslim World*, 102 (2012), p. 1–32.

it for granted that any serious student would know he refers to Euclid's *Elements of Geometry*, Ibn Sīnā asserts that the point he has just made in the *Metaphysics* finds support in geometrical demonstrations in the work of the famous mathematician from Alexandria.[39] Since Ibn Sīnā apparently saw no need to elaborate, we are left to assume that he did not mean the *Elements* could contribute to solving the issue of the dependence of originated things on an originating principle. The proof of causality, in any form, is not Euclid's concern in the *Elements* – rather, by using definitions, postulates, and axioms as premises of geometrical demonstrations, Euclid *presupposes* causality insofar as these definitions and so on function as causes in syllogisms. The significance of the *Elements* lies elsewhere. In Ibn Sīnā's view, it seems, the work illustrates that some geometrical problems which might seem obvious to a non-geometer require proof in the eyes of the skilled geometer. Ibn Sīnā intends to say that this is analogous to the situation of the metaphysician, who recognises that certain matters might be widely accepted among many people not because they should be self-evident, but rather because they fall into the category of commonly held beliefs. As the *Elements* illustrates for the case of the geometer, the metaphysician must provide proof for such matters.

The student of metaphysics might at this point recall her study of the books on the mathematical sciences in the *Healing*. The book on geometry was based on Euclid's *Elements*, famous as the "paradigm of rigorous mathematical reasoning."[40] She might even be aware of parts of Proclus's (d. 485 CE) commentary on the *Elements*, since although this commentary was never in its entirety translated into Arabic, parts of it appear to have circulated in the Arabic tradition.[41] Thus, she might

[39] I am indebted to Robin C. Hartshorne for helping me make sense of Ibn Sīnā's mention of Euclid in this context.

[40] Ian Mueller, "Euclid's Elements and the Axiomatic Method," *The British Journal for the Philosophy of Science*, 20 (1969), p. 289–309, p. 289.

[41] Compare A. I. Sabra, "Thābit ibn Qurra on Euclid's Parallels Postulate," *Journal of the Warburg and Courtauld Institutes*, 31 (1968), p. 12–32, p. 12; Gregg De Young, "Two hitherto unknown Arabic Euclid manuscripts," *Historia Mathematics*, 42 (2015), p. 132–154, especially p. 143. I am grateful to Mohammad Saleh Zarepour for pointing me to these two articles on the transmission of Proclus's commentary in the Arabic tradition. It should also be considered that other works by Proclus, e. g. his *Elements of Theology*, were translated into Arabic by al-Kindī's circle during the so-called "Translation Movement" in the 3rd/9th century. In the *Elements of Theology*, Proclus deliberately followed the demonstrative method propagated by Euclid's *Elements of Geometry*. Compare Peter Adamson, *Al-Kindī* (Oxford, New York, 2007), p. 36.

remember that Proclus recorded Euclid being ridiculed by certain opponents for presenting proof of a geometrical proposition which they considered evident and without need of proof. The proposition in question was "In any triangle two sides taken together in any manner are greater than the remaining one" (i. e. book 1, proposition 20).[42] Proclus commented:

> The Epicureans are wont to ridicule this [proposition], saying it is evident even to an ass and needs no proof; it is … the mark of an ignorant man, they say, to require persuasion of evident truth … . That the present [proposition] is known to an ass they make out from the observation that, if straw is placed at one extremity of the sides, an ass in quest of provender will make his way along the *one* side and not by way of the *two* others.[43]

For the Epicureans, demanding proof for a geometrical problem evident even to a creature as lowly as an ass deserves ridicule. But in Proclus's eyes, Euclid was justified in subjecting this proposition to proof:

> To this it should be replied that, granting the [proposition] is evident to sense-perception, it is still not clear for scientific thought. Many things have this character; for example, that fire warms. This is clear to perception, but it is the task of science to find out how it warms … . So with respect to a triangle let it be evident to perception that two sides are greater than the third; but how this comes about it is the function of knowledge to say. This is enough by way of answer to the Epicureans.[44]

All that the Epicureans could be said to be able to show by reference to the ass, Proclus maintains, is that some things are obvious to our senses. But the realm of common observations and everyday experience, as we might call it, is unlike the realm of science. In the realm of geometry, other standards apply. The geometer delves deeper and searches for the reason why something is the case. The student of metaphysics would

[42] Euclid, *Elements of Geometry = The Thirteen Books of Euclid's* Elements*, Translated from the Text of Heiberg with Introduction and Commentary by T. L. Heath*, vol. 1: "Introduction and Books I, II," (Cambridge, 1968), p. 286.

[43] Proclus, *A Commentary on the First Book of Euclid's* Elements*, Translated with Introduction and Notes by Glenn R. Morrow* (Princeton, 1970), p. 251; emphasis added.

[44] Proclus, *Commentary*, p. 251–252.

immediately see how this corresponds to Ibn Sīnā's insistence that the metaphysician demand a proof of causality despite its being commonly accepted as true.

This would not have been the first time the student became aware that Ibn Sīnā urged caution in accepting things as self-evident. In the *Physics*, he made this clear with regard to the existence of nature as a power causing the motions of bodies. Referring to Aristotle's statement in the *Physics* that "[t]he one who seeks to prove [that nature exists] deserves to be ridiculed," Ibn Sīnā comments that this is an "odd" judgment.[45] Aristotle must have intended that demanding a proof of nature *in physics* deserves ridicule, since no science proves its own principles and nature is postulated in physics. The natural philosopher is therefore justified in stating that "it is *obvious* (*min al-ẓāhir*) that what causes movement is not the body *qua* body, but a power in it."[46] If Aristotle intended to claim that "the existence of this power is self-evident (*bayyin bi-nafsihi*)," however, then that must be rejected outright. Nature is far from being evident in itself, and so its proof belongs to the science above physics – metaphysics.[47]

Taking all of this into consideration – that causality requires proof and that the sciences inferior to metaphysics cannot possibly provide such proof – the student of metaphysics would gladly assent to Ibn Sīnā's final words that "the demonstrative clarification of this does then not belong to any other science, and it must consequently take place in this science." But there is another reason, as Ibn Sīnā later explains, why this proof has to be provided by metaphysics. He has alluded to it before: "in being a cause or an effect, the existent does not need to be natural or mathematical or so on."[48] Causality is broader than, say, its particular manifestation in nature as a principle of motion, or its geometrical manifestation in the three sides of a triangle which cause the triangle's existence.[49] Only metaphysics, dealing with the existent insofar as it is an existent, encompasses all manifestations of causality.

[45] Ibn Sīnā, *Al-samāᶜ al-ṭabīᶜī*, p. 40. Ibn Sīnā here refers to Aristotle's *Physics* book 2, chapter 1, 193 a 3.
[46] Ibn Sīnā, *Al-samāᶜ al-ṭabīᶜī*, p. 38; emphasis added.
[47] Ibn Sīnā, *Al-samāᶜ al-ṭabīᶜī*, p. 40.
[48] Ibn Sīnā, *Al-ilāhiyyāt*, p. 20, § 4.
[49] Ibn Sīnā, *Al-burhān min Al-šifāᵓ*, p. 218 (triangle).

5. DEMONSTRATING CAUSALITY

The student of metaphysics would not have to turn very many pages to find out what the "demonstrative clarification" of causality is.[50] It is put forward in chapters 5 and 6 of the first book of the *Metaphysics*. Ibn Sīnā begins by noting that the meanings (*maʿānin*) of "the existent," "the thing," "the necessary," "the established," "the realised," "the possible," and "the impossible" "are inscribed on the soul in a primary way (*irtisāman awwaliyyan*)."[51] He compares these meanings to primary propositions which function as principles in syllogisms (*mabādiʾ awwaliyya*). Like primary propositions, they are conceptually grasped and assented to instinctively. Nothing is better known than these meanings, and nothing can bring about assent to them. Any attempt to define such an "evident (*ẓāhir*) thing" would entail having recourse to something less known, and would consequently be a useless enterprise.[52] This is especially true of "the existent insofar as it is an existent … , [which] is above the need for its essence to be learned and for it to be established" and so can be admitted (*taslīm*).[53] Even "the common people comprehend the reality" of these meanings.[54]

Ibn Sīnā confidently asserts that "we do not doubt that their meaning has been realised in the soul of everyone who reads this book," yet he takes particular care to remind the student of metaphysics what "the thing" signifies.[55] It refers to the essence (*ḥaqīqa*) through which every thing is what it is. A triangle is a triangle on account of the essence of "triangle-ness," he explains, and whiteness is what it is on account of its particular essence. He adds that it is "clear" (*min al-bayyin*) that things are distinguished from each other by their specific essences.[56] It

[50] I don't think that there is any special significance to the expression "demonstrative clarification" (*bayān burhānī*) rather than simply "demonstration" (*burhān*), which Ibn Sīnā could have chosen. At *Al-burhān min Al-šifāʾ*, p. 44, he speaks of a *bayān* which provides the cause, thus referring to a demonstrative syllogism. Compare footnote 27.

[51] Ibn Sīnā, *Al-ilāhiyyāt*, p. 22, § 1. The first three terms are mentioned in this quote, the fourth and fifth on p. 24, § 8, the sixth and seventh on p. 27–28, § 22.

[52] Ibn Sīnā, *Al-ilāhiyyāt*, p. 23, § 5.

[53] Ibn Sīnā, *Al-ilāhiyyāt*, p. 9–10, § 12.

[54] Ibn Sīnā, *Al-ilāhiyyāt*, p. 23, § 5.

[55] Ibn Sīnā, *Al-ilāhiyyāt*, p. 24, § 8. What Ibn Sīnā does here is what he himself describes in the following words: "If one wanted to indicate them [i. e. principles of conception], this would in reality not be making known something unknown, but it would [only] be alerting to them and bringing them to mind through a word or a sign, which would in themselves be less known but which would, for some reason or circumstance, be clearer in their indication;" Ibn Sīnā, *Al-ilāhiyyāt*, p. 23, § 2.

is moreover "known" that "the essence proper to each thing is not identical with the existence,"[57] or, to put it differently, "existence is external to (*ḫāriǧ ʿan*) the definition of [a given thing]."[58] This means that considering what a triangle is, or what whiteness is, does not entail considering them as existents. This is why Ibn Sīnā emphasises that "the existent" and "the thing" have two different meanings. And yet, since something's being a "thing" – say, a triangle – means that information can be given about it, and since information can only be given about existing things,[59] Ibn Sīnā asserts that "the meaning of existence is always necessary for it, whether it is an existent in the external world or an existent in estimation and the intellect."[60]

His analysis of the relationship of a thing's essence to its existence allows Ibn Sīnā to state next that, in our mind, we undertake a dual division with respect to things. When considering their essences, we come to realise either that existence is neither a necessity for them nor an impossibility, which means that it is possible – or we come to realise that existence is a necessity for them. This dual division is a rather obvious notion for Ibn Sīnā, since possibility and necessity are accidents (*ʿawāriḍ*) of the existent insofar as it is an existent, being "things that accompany it insofar as it is an existent, without any condition."[61]

The dual division turns out to be key in arriving at the proof of causality: Ibn Sīnā next states that "the necessarily existent in itself *has no cause*, while the possibly existent in itself *has a cause*."[62] Turning to the first division, he states: "That the necessary existent has no cause is obvious (*ẓāhir*)."[63] Despite the obvious nature of this fact, he puts forward an explanation in the form of an argument *ad absurdum*: If we were to maintain that the existence of a necessarily existent thing is dependent on, and brought about by, a cause, we would contradict our previous assessment that existence is necessary for the thing. This is a contradiction, as "it is impossible that a thing should be necessarily existent in itself and necessarily existent through another at the same

[56] Ibn Sīnā, *Al-ilāhiyyāt*, p. 24, § 10.
[57] Ibn Sīnā, *Al-ilāhiyyāt*, p. 24, § 10.
[58] In the *Physics*, he emphasised that there is "nothing more evident" (*aẓhar*) than that existence *qua* existence is different from humanity *qua* humanity; Ibn Sīnā, *Al-samāʿ al-ṭabīʿī*, p. 34.
[59] Ibn Sīnā, *Al-ilāhiyyāt*, p. 27, § 18.
[60] Ibn Sīnā, *Al-ilāhiyyāt*, p. 25, § 11.
[61] Ibn Sīnā, *Al-ilāhiyyāt*, p. 10, § 13.
[62] Ibn Sīnā, *Al-ilāhiyyāt*, p. 30, § 2; emphasis added.
[63] Ibn Sīnā, *Al-ilāhiyyāt*, p. 30, § 3.

time." (Ibn Sīnā here employs as a principle – without explicitly stating it – the most primary of all propositions, that there is no intermediary between negation and affirmation.)

All of this "is clear" (*fa-bayyana*) and "obvious" (*fa-qad ẓahara*) in Ibn Sīnā's estimation.[64] Turning to the other division, he states: "Whatever is possibly existent when considering its essence, its existence and non-existence are both due to a cause."[65] Here, too, an explanation follows, once more in the form of an argument *ad absurdum*: If we were to maintain that the essence of a thing is sufficient (*takfā*) to entail its existence, then we would be dealing with a necessarily existent essence – but this would contradict our previous assessment that, considering its essence, existence is only possible for the thing. Consequently, "its existence is due to the existence of some other thing, which is not its essence, but which is necessary for it [to exist], and this is its cause, and so it has a cause. … It must become necessary through a cause and in relation to it."[66]

This is where Ibn Sīnā's proof that there is such a thing as cause and effect ends. He has provided a justification in the form of a "demonstrative clarification" for our conviction – which he considers far from being self-evidently true – that causality is a feature of reality. It should, however, be pointed out that causality, as just proven by Ibn Sīnā, is in fact a particular kind of causality: *efficient* causality. This will become clear to the student of metaphysics once he has left behind the present discussion in book 1, chapters 5 and 6 and reached the discussion of the fourfold division of causes in book 6, chapter 1. ("The causes are, as you have heard, form, element, agent, and end."[67]) There, Ibn Sīnā defines the efficient cause as the "principle and giver of existence" to another.[68] This is the very kind of cause that his proof of causality as such established when it framed causality as the dependence of the existence of a possibly existent thing on some other thing.

It certainly has to be said that Ibn Sīnā's discussion of the topic of causality is far from exhausted with the proof that there is such a thing as cause and effect. The greater part of it takes place in his later detailed

[64] Ibn Sīnā, *Al-ilāhiyyāt*, p. 30, § 3.
[65] Ibn Sīnā, *Al-ilāhiyyāt*, p. 31, § 4.
[66] Ibn Sīnā, *Al-ilāhiyyāt*, p. 31, § 5. I am leaving aside Ibn Sīnā's argument that non-existence, too, is caused, not just existence, and that the cause of a thing's non-existence is "the non-existence / absence of the cause" giving it existence; Ibn Sīnā, *Al-ilāhiyyāt*, p. 31, § 5.
[67] Ibn Sīnā, *Al-ilāhiyyāt*, p. 194, § 2.
[68] Ibn Sīnā, *Al-ilāhiyyāt*, p. 195, § 2.

analysis of the four kinds of causes in the several chapters of book 6. But this later analysis ("It is fitting that we now discuss cause and effect"[69]) *presupposes*, and *depends on*, the earlier proof that cause and effect *are* indeed features of reality. When Ibn Sīnā for the first time introduces the notion of causality in his analysis of the necessarily existent and the possibly existent, then this is of much greater significance for his aim to put forward a "demonstrative clarification" of the reality of cause and effect than merely being, say, a conceptual tool to discriminate between the two kinds of existent or merely anticipating the later detailed analysis of cause and effect. Instead, the proof of causality as such is presented by Ibn Sīnā as a fundamental prerequisite to his analysis of the ways in which causality manifests itself.

Having emphasised its significance, let me spell out how Ibn Sīnā's proof of causality is a "demonstrative clarification." For one thing, he can claim to have reached the highest degree of certainty, the epistemic goal of demonstration. In the *Book of Demonstration* of the *Healing*, he defined truly certain knowledge as being the conviction (*iʿtiqād*) that X is Y, together with the conviction that X cannot ever *not* be Y. Knowledge thus has the greatest degree of certainty if it is about an unchanging entity, rather than one that could be different.[70] This is why primary propositions, such as the proposition that there is no intermediary between negation and affirmation, are on the highest level of certainty. They are permanently and always true, for their truth is self-evident and does not depend on some cause to bring it about. They are also universally true, for *all* things, not just for *some* things, as "[they] belong to the accidents not of one thing, but to the accidents of the existent insofar as it is an existent."[71]

The highest degree of certainty is also yielded by Ibn Sīnā's proof that "[there are] causes for things which are effects." This is so because he builds his whole proof on the concepts of the existent, the thing, ne-

[69] Ibn Sīnā, *Al-ilāhiyyāt*, p. 194, § 1.

[70] Ibn Sīnā, *Al-burhān min Al-šifāʾ*, p. 31. Ibn Sīnā gives the following example for a conviction that is not perpetually certain because it is about a changing entity, i. e. a particular rather than a universal: "This house is something formed, and everything that is formed has a former … [This] syllogism … is not something that brings about perpetual certainty, for this house is something that gets corrupted, and so the conviction ceases and only existed as long as [the house] existed. Perpetual certainty cannot cease;" Ibn Sīnā, *Al-burhān min Al-šifāʾ*, p. 39.

[71] Ibn Sīnā, *Al-ilāhiyyāt*, p. 39, § 2. Compare also Ibn Sīnā, *Al-burhān min Al-šifāʾ*, p. 189: "Certainty is to believe that a thing is like this and also to believe that it cannot not be like this, a conviction which occurs because it cannot cease [to be like this]. If it is self-evident, it cannot cease [to be like this]."

cessity, possibility and so on. They are primary concepts and as such are conceptually grasped and affirmed in themselves, just like primary propositions. The proof of causality itself rests on nothing other than an analysis of the existent and "the things which accompany it insofar as it is an existent, without any condition."[72] Since Ibn Sīnā declares being a cause or an effect to be something that *necessarily* attaches to all existents ("cause and effect belong to the necessary concomitants of the existent insofar as it is an existent"[73]), the proof of causality yields an unchanging, truly certain item of knowledge. It could never *not* be true that existents are either caused or uncaused. Causality does not *cease* to be a "feature" of existents. But more than that, since causality extends to the existent insofar as it is an existent, it is "something common to all things" and covers the *whole* of reality.[74]

In seeking the epistemic gold standard of certainty, Ibn Sīnā prides himself that his "demonstrative clarification" of causality is "from universal, rational premises (*muqaddimāt kulliyya ʿaqliyya*) which make [it] necessary."[75] Being based on such premises, it is *reason* alone which arrives at the "demonstrative clarification" of causality. "The existent, the thing, the cause, the principle, the particular, the universal, the end, and so on," Ibn Sīnā explicitly states in the *Book of Demonstration* of the *Healing*, "are all external to (*ḫāriğa ʿan*) sensible things … and they cannot ever be grasped by imagination (*yataḫayyal*) or represented in our estimation (*tatamaṯṯal fī awhāninā*) – only our intellect grasps them."[76] Reason alone, operating with universal concepts, can demonstratively deduce causality; the sensible faculties of the animal soul, which have no universal concepts, cannot.

This once more underlines the limits of sense experience in Ibn Sīnā's proof. To be sure, he does not deny that "when we first observe existence and come to know its states, we observe this natural existence."[77] Sense

[72] Ibn Sīnā, *Al-ilāhiyyāt*, p. 10, § 12. The student of metaphysics would at this point also realise why the proposition "[there are] causes for the things having causes" was earlier categorised as belonging to commonly held matters: It was lacking this analysis, which would reveal the causal relationship as the bestowal of existence. Only by framing causality in this way, it can be considered "obvious."

[73] Ibn Sīnā, *Al-ilāhiyyāt*, p. 194, § 1.

[74] Ibn Sīnā, *Al-ilāhiyyāt*, p. 9, § 12.

[75] Ibn Sīnā, *Al-ilāhiyyāt*, p. 16, § 11. He says this about the proof of the necessarily existent and its characteristics (which is his proof of God's nature). But this proof is only an extension of the twofold division of existence and is based on it. The statement is thus also true of the proof of causality.

[76] Ibn Sīnā, *Al-burhān min Al-šifāʾ*, p. 18.

[77] Ibn Sīnā, *Al-ilāhiyyāt*, p. 17, § 13. As the so-called "Flying Man" thought experi-

experience *does* play a role in forming concepts, including primary ones and those used in primary propositions, such as "the whole," "the part," and "greater." These come about "with the help of the senses."[78] It is through sense experience that the faculties of the animal soul receive the impressions of *a* whole, *a* part – and, for that matter, *a* natural existent. But these impressions in the animal soul only become universal concepts when the intellect receives their form which is completely abstracted from all material concomitants.[79] Causality as such, being a universal concept that transcends particular manifestations, resides in the intellect alone. And so the *genesis* of universal concepts is one thing, the question whether sense experience can *prove* causality is another.

6. CONTEXTUALISING IBN SĪNĀ'S PROOF OF CAUSALITY

I have pointed out that the proof of causality is of major significance for Ibn Sīnā's system of science. But in order to get a sense of the import that his specific considerations in the *Metaphysics* of the *Healing* have, it is useful to relate them to competing approaches by other historical actors. I therefore want to make a few short remarks about the historical context in which he formulated his proof of causality; a more thorough account would be worthwhile, but goes beyond the scope of this article.

The way in which Ibn Sīnā approaches the proof of causality suggests that he had in mind similar discussions among the practitioners of another science, *kalām* (speculative theology). In particular his insistence that our conviction – however widespread it may be – that originated effects depend on a cause cannot reach the epistemic goal of certainty, suggests a critique of the *mutakallimūn*.

The proof that the world's existence depends on God, and that God is its creator, played an important role in *kalām* works before Ibn Sīnā.[80]

ment shows, theoretically one can grasp and affirm existence without recourse to the senses – however, this is certainly not representative of how Ibn Sīnā thinks ordinary humans, who are commonly not created instantaneously while floating mid-air, come to acquire such notions. Compare Michael E. Marmura, "Avicenna's 'Flying Man' in Context," *The Monist*, 69 (1986), p. 383–395.

[78] Ibn Sīnā, *Al-manṭiq min Kitāb al-naǧāt*, p. 65.

[79] This is a general point in Ibn Sīnā's epistemology, which he emphasises repeatedly and in different works. Compare Jon McGinnis, *Avicenna* (Oxford, New York, 2010), p. 89–148.

[80] Compare Herbert A. Davidson, *Proofs for Eternity, Creation, and the Existence of God in Medieval Islamic and Jewish Philosophy* (New York, Oxford, 1987); Hannah C. Erlwein, *Arguments for God's Existence in Classical Islamic Thought: A Reappraisal of the Discourse* (Berlin, Boston, 2019).

For this proof, it was thought to be essential to argue that the world is originated in time (*muḥdaṯ*). The reason is that, for the *mutakallimūn*, originated things require, by virtue of their being originated, a creator. "The originatedness [of things in the world] makes it necessary that they have an originator who originated them, since it is absurd that there is origination without originator," it was argued.[81] An eternal world could, in their view, not be causally connected with God, since "the eternal is characterised as self-sufficient and it does not depend on another in view of its eternity."[82]

Some *mutakallimūn* argued that the dependence of something originated on a cause constitutes a necessary and immediate (*ḍarūrī*, *badīhī*) item of knowledge.[83] Yet, the intuitiveness and certainty which they attached to this item of knowledge stands in striking contrast to Ibn Sīnā's assessment "Nor is it the case, even if it comes close to being self-evident to the mind that originated things have some principle, that this must be self-evident."

Other *mutakallimūn* argued that this knowledge is acquired (*muktasab*) following rational investigation. This meant having recourse to phenomena of sense experience, which allowed drawing rational conclusions from them. Our experience that it is impossible "that the colours of a garment change on their own, rather than through dyeing, or that a ship becomes what it is on its own,"[84] for instance, could thus be used to justify that originated things, including the world, must be caused by an originator. This justification, as defended by the *mutakallimūn*, is at odds with Ibn Sīnā's insistence that sensation and experience are not a valid basis to justify the reality of cause and effect.

It is known that the philosophical system of the sciences differed considerably from its religious counterpart – both in terms of the division of the sciences and the sources knowledge – up until the time of

[81] Al-Ḫayyāṭ, *Kitāb al-intiṣār wa-l-radd ᶜalā Ibn al-Rawandī al-mulḥid*, ed. H. S. Nyberg (Cairo, 1925), p. 47.

[82] Al-Māturīdī, *Al-tawḥīd*, ed. Fathalla Kholeif (Beyrouth, 1970), p. 11. In his attack on philosophy in the *Tahāfut al-falāsifa*, al-Ġazālī (d. 505/1111) acknowledges that, in principle, something eternal can be caused, but like the *mutakallimūn* before him, he denies that this characterises God's relationship with the world, which is created and originated in time. See Erlwein, *Arguments for God's Existence*, p. 149.

[83] Compare Binyamin Abrahamov, "Necessary Knowledge in Islamic Theology," *British Journal of Middle Eastern Studies*, 20 (1993), p. 20–32.

[84] Al-Māturīdī, *Al-tawḥīd*, p. 18–19. He puts forward this argument in the section on proofs that the world has an originator (*al-dalīl ᶜalā anna li-l-ᶜālam muḥdiṯ*, p. 17f.), following the section on proofs for the origination of the world (*al-dalīl ᶜalā ḥadaṯ al-aᶜyān*, p. 11f.).

Ibn Sīnā.[85] The *mutakallimūn* and Ibn Sīnā essentially operated within two different scientific paradigms. The varying, and even diametrically opposed, approaches to establishing causality, which I have alluded to, are indicative of these different paradigms. In the science of *kalām*, the paradigm entailed that phenomena of experience in the material world around us – construed as bodies (*aǧsām*) with their various accidents (*aʿrāḍ*) – were made the starting point of all investigations. In contrast, Ibn Sīnā's "existent *qua* existent" represented a paradigm that sought to transcend material existence as the starting point of investigations within the science beyond physics, i. e. metaphysics. Ibn Sīnā's proof of causality therefore implicitly amounts to nothing less than a critique of the religious scientific paradigm.

7. CONCLUDING REMARKS

Ibn Sīnā's proof of causality is, as I have argued, a specifically *metaphysical* proof: on the one hand, because causality is a feature not only of, say, natural existents, which would be dealt with by physics, but of all existents ("the existent insofar as it is an existent"), thus falling under the domain of metaphysics; on the other, because all other sciences presuppose causality, and therefore metaphysics, being at the top of their hierarchy, has to undertake its proof. Ibn Sīnā made the point that causality cannot be taken for granted, and that empirical data derived from observation and experience cannot justify it. The proof of causality must be nothing less than a "demonstrative clarification," taking as its starting point universal, primary concepts from which "the existence of causes for things which are effects" can be rationally deduced, yielding the highest degree of certainty.

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[85] See Franz Rosenthal, *The Classical Heritage in Islam* (London, New York, 1975), p. 52–70; Anna A. Akasoy and Alexander Fidora, "The Structure and Methods of Science," in Richard C . Taylor and Luis Xavier López-Farjeat (eds.), *The Routledge Companion to Islamic Philosophy* (London, 2016), p. 105–114.