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## METAPHYSICS II

### *Cosmology*

#### Introduction: The Historical Background

In the last chapter I presented a complex of problems that faced ancient and medieval philosophers concerning God's relation to the world. Of this complex of issues, the primary one treated in the last chapter involved showing Avicenna's solution to the problem of how God could be both the final and efficient cause of the world and still be simple. Additionally, many (though by no means all) of these philosophers also wanted to show that the cosmos was eternal. I noted two classical arguments for why one might hold this position. One was that of Proclus, who maintained that if, in the finite past, there were some first moment of creation, then there would be a time when God was not creating (and so would not have been a creator) and then a time when God was creating (and so becomes a creator). This change in God—which it was argued results from affirming a temporal creation—undermines divine immutability, a position that most philosophers and theologians did not want to give up. Similarly, I gave one of Aristotle's physical proofs based upon his analysis of time and motion. That argument ran thus: If there were some first moment in the finite past when the cosmos began moving, nothing moving prior to that moment, then there would be a time when there was no motion. Time, however, is just the

measure of motion. Thus, to say there is a time when there is no motion is tantamount to saying there was a measured motion when there was no motion at all, a patent contradiction.

A premise common to both of these arguments is that if there were a first moment of creation, there would be a preceding time, either during which God is not creating or during which there is no motion. At least by the late classical period, however, this premise was called into question. The main line of objection for certain Christian and Muslim defenders of a temporal creation was that the sense of such seemingly temporal terms as "before" and the use of the past tense "was," both prominent features that these arguments exploit, need not indicate a preexisting time at all. Instead, argued these later critics, time is itself part of the created order. As such, it could not have temporally preexisted creation, and instead is created along with the cosmos.

These critics then maintained that Aristotle and Proclus's proofs simply beg the question when they assert that the sense of "before" in the phrase "before creation" must refer to a temporal "before." Such language, it was argued, merely means that God is ontologically prior to the world in the way that a cause might be ontologically prior though not temporally prior to an effect. So, for example, while waving a hand is clearly not temporally prior to the movement of a ring on the hand, the hand's motion is causally prior to the ring's motion inasmuch as it is the hand's motion that causes the ring to move and not vice versa. At the very least one sees such thinkers as Augustine<sup>1</sup> and Philoponus<sup>2</sup> in the West and al-Ghazālī<sup>3</sup> in the East raise this sort of objection. In fact, even Avicenna himself, who defends the cosmos' eternity, mentions this as a serious objection worthy of consideration.<sup>4</sup>

Still, there were other arguments that did not seem to require the questionable premise that there must be a time before creation. Aristotle again provides one such argument based upon his own careful investigation of coming to be and generation (*genesis*). So, for example, at *Physics* I.7, Aristotle famously analyzed coming to be in terms of three principles: (1) an underlying thing (*hupokeimenon*), namely, matter, (2) a certain privation in that underlying thing corresponding with the absence or privation of some form, and finally (3) the new form that comes to be as a result of the generation.<sup>5</sup> So, for example, if a quantity of water comes to be hot, there must be the water, which is the underlying thing that undergoes the change, an initial privation or absence of heat (for if the water were already hot it could not qua hot become hot), and finally the form, that is to say, the heat that comes to be in the water.

Using this analysis of coming to be as his starting point, Aristotle then argued for the eternal existence of forms and matter as follows:<sup>6</sup> The cosmos itself is a composite of matter and forms. Thus, if God were to generate the existence of the world, he would have to generate matter and forms; however, as has already been seen, for Aristotle every instance of coming to be or generation requires an underlying thing that undergoes the change, namely, the matter, as well as the forms that come to be and pass away. Hence, in order for there to be the generation of matter and forms, matter and forms would already have had to exist, which is clearly a contradiction. Thus, the initial assumption, namely that the form-matter composite that is the cosmos was generated at some finite time ago must be false. Therefore, concludes Aristotle, the cosmos has existed eternally.

The response to such an argument is simply to distinguish between the sort of temporal coming to be implicit in Aristotle's theory of generation, where the generation comes to be from some preexisting stuff, and "genuine creation" in which God creates *ex nihilo*, and thus nothing other than God is ontologically prior to creation such that it would exist or subsist independently of God's creative act. Interestingly, such a distinction, while quickly disarming Aristotle's generation argument for the eternity of the world, was not only favored by those who believed that the cosmos had a temporal creation in the finite past, but also virtually all of those thinkers who maintained that the divinity stood to the cosmos as its efficient cause, regardless of whether they thought that the cosmos had existed eternally or not. Thus, another argument in the eternalist's arsenal seems to lack the demonstrative nature that both ancient and medieval philosophers and scientists sought.

Proponents of the cosmos' temporal creation were not merely on the defense, but also actively argued that the idea of an eternally existing cosmos ran afoul of certain entrenched doctrines concerning the infinite. Perhaps the staunchest critique of Aristotle and the doctrine of the world's eternity was the Christian Neoplatonist, John Philoponus (ca. 490–570).<sup>7</sup> Philoponus's critique of this Aristotelian position ironically used Aristotle's own principles concerning the infinite against him. The principles Philoponus used are the seemingly self-evident claims that an actual infinite<sup>8</sup> is impossible, an infinite cannot be traversed, and nothing is beyond or greater than an infinite.<sup>9</sup> Philoponus had two main lines of objection: One, an eternal world would entail that an actual infinite has come to exist and so an infinite has been traversed, and, two, there would be sets of infinities

of different sizes, and so there would be sets larger than that beyond which there is nothing more.<sup>10</sup>

The first of Philoponus's arguments takes the following form: If the world were eternal, as Aristotle and others believed, then it would entail that there has been an infinite number of past days. Now, if during this infinity of days, one human per day, for example, were born, then an actually infinite number of humans would have come to exist. It does not matter that they do not all exist right now, continued Philoponus, since the *number* of humans who have existed must be actually infinite. Aristotle himself, however, had said that not even number considered separately could be infinite.<sup>11</sup> Moreover, criticized Philoponus, the cosmos' past eternity is incompatible with the dictum that an infinite cannot be traversed, for an eternally existing cosmos would have gone through an infinity of days (as well as things generated during those days), but again traversing the infinite is impossible absolutely according to Aristotle and others.

Philoponus's second complaint was that if the cosmos were eternal, there would be varying sizes of infinities. Indeed the infinite would be susceptible to increase. For example, if the cosmos' existence were extended infinitely into the past, then the Sun, Moon, and all the planets would have orbited the Earth an infinite number of times (at least based on ancient and medieval cosmology, which has the Earth at the center of the universe). Saturn, however, makes an apparent rotation around the Earth once approximately every thirty solar years; Jupiter once every twelve solar years; Mars once every two solar years, and the Sun, of course, once every year. Consequently, the Sun, for example, must have made thirty times as many apparent rotations around the Earth as Saturn has. Thus, asks Philoponus, "If it is not possible to traverse the infinite once, then how is it not beyond all absurdity to assume ten thousand times the infinite, or rather the infinite an infinite number of times?"<sup>12</sup> The challenge that this paradox presents, then, is to explain how one is to make sense of different "sizes" of infinities.

Despite the ferocity of Philoponus's polemics, many of those medieval philosophers writing in Arabic, such as Avicenna, still held that the cosmos was eternal. Thus, at least one major project for these medieval thinkers was either to revise or to reinvent arguments for the world's eternity that could address the objections to the proofs for the world's eternity as well as responding to the criticisms that it is impossible that the world's eternity be consistent with long-held beliefs about infinity.

In both his physics and metaphysics, Avicenna undertakes this project. In many respects Avicenna's "new" arguments for the world's eternity are variants of the classical proofs for that thesis, except that Avicenna adds new modal premises that allow him to address the objections mentioned head-on. To appreciate these new arguments, I need first to present in some depth Avicenna's conception of possibility and what exists possibly in itself, as well as considering how Avicenna envisions the most basic modes of possible existence, namely, substances and accidents, with a particular emphasis on forms and matter. The reason for emphasizing forms and matter is that in Avicenna's ontology, like Aristotle's before him, substances are prior to accidents. Moreover, the conceptually most basic kinds of substances, from which particular substances, like earth, oaks, humans, and so forth are composed, are forms and matter. After discussing the formal and material causes, I then turn to Avicenna's notion of causality generally. Upon completing this investigation of the makeup of the realm of possible existence, one will be in a position to appreciate Avicenna's new modal arguments for the world's eternity and his response to the criticism against that thesis. This chapter, then, concludes with a section on the Necessary Existent's relation to possible existence as exemplified in Avicenna's unique twist on the Neoplatonic theory of emanation.

### Creation and Possible Existence in Itself

As I have noted in the previous chapter, for Avicenna all things possible in themselves ultimately depend upon the Necessary Existent for their own actual existence, or, as Avicenna would have it, their own necessary existence, albeit an existence necessary only through another. So, in a real sense all things possible in themselves when actualized are ultimately the creation of the Necessary Existent. Avicenna, however, distinguishes two forms of creation: what one might call "atemporal creation" (*ibdā'*), or creation absolutely, and "temporal creation" (*ḥudūth*), or coming to be.<sup>13</sup> In atemporal or absolute creation nothing precedes the creative act except the being of the Creator, who is only ontologically, not temporally, prior to the creation. Avicenna's notion of atemporal creation is one of genuine creation *ex nihilo*, and so is unlike Aristotle's notion of generation, which required preexisting forms and matter. In this respect, Avicenna's notion of atemporal creation is sensitive to the complaint of the temporal creationists when they say that the

world's being created after not existing need not imply that there was a time before creation. Still, there is also nothing about Avicenna's notion of absolute or atemporal creation that precludes the Creator from creating eternally. Hence, there is nothing that requires that there be some first moment in the finite past when the Creator began creating. As for temporal creation or, more exactly, coming to be, it involves some sort of motion, or change, and the coming to be at some time of something after it was not. So, for example, virtually all the events that we experience around us involve coming to be—I came to exist after not existing; you are reading this sentence after not having read it, and the like. Thus, our world (or at least the world of sublunar physics in Avicenna's mind) inherently involves coming to be.

In order to answer the question of whether the cosmos in general has existed eternally or had a temporal beginning in the finite past, Avicenna undertakes an analysis of the possible existents that make up the cosmos, an analysis, I might add, that was arguably the most thoroughgoing investigation of possibility in the ancient and medieval world.<sup>14</sup> The primary focus of Avicenna's analysis is on the possibility of those things involving coming to be, and with a particular eye to whether forms and matter, considered absolutely, as well as motion and time, must be eternal or could have had a temporal beginning. Still, much of what he has to say about the nature of possibility equally applies to the possibility of atemporally created things, such as for Avicenna the immaterial Intelligences.

In book II.1 of his *Metaphysics*, Avicenna begins by considering two divisions of existence found among the things that are possible in themselves though necessary through another (*Metaphysics*, II.1, 45.9–13). The first division includes those things that exist in another—call that other the “subject” (*mawḍūʿ*)—and cannot exist separate from that subject, even though they are not themselves (material or formal) parts of the subject. The second includes those things that do not exist in another in this way. The first class consists of the so-called accidents—namely, quantity, quality, position, relation, when, where, possession, action, and passion—while the second class is that of substances.

Assuming this simple division, Avicenna has us consider the possible existence (*mumkin al-wujūd* or *jāʾiz al-wujūd*) in itself considered merely as possible, and thus considered independent of any necessary existence it might have derived from another. He then asks whether possible existence in itself is either something subsisting in itself, and so a substance in its own

right, or something inhering in a subject or substrate (*Physics*, III.11; *Metaphysics*, IV.2).

Avicenna denies that possibility is a substance in its own right on the basis that substances do not essentially involve relations (*ghayr muḍāf*)—nothing else is needed to complete, perfect, or understand them as substances—whereas possibilities are always correlative and so always require something else if they are to be intellectually understood—for at least two related things are needed to complete one's understanding of any relation (*Physics*, III.11, 233.4–5; *Metaphysics*, IV.2, 136.16–17). Avicenna makes this point about relation clearly at *Metaphysics*, III.10, where he explains that a relation (*idāfa*) is some essence, such as fatherhood, or being a sibling, that belongs to a given thing and can be intellectually perceived only by reference to (*bil-qiyās ilā*) something else.<sup>15</sup> So, for example, a father, according to Avicenna, really has some aspect, fatherhood, that belongs to him, where the notion of fatherhood is relational inasmuch as it can be understood only by reference to having an offspring.

Thus, when one says, “*x* has the possibility of coming to be *F*” or even some blanket statement like “possibility exists,” one understands it only by reference to understanding what *F* is (or some necessary, that is, actual existence) and then recognizing the absence of *F* (or that necessary existence) in *x* (*Physics*, III.11, 233.5–6). Now, the argument continues, if possibility in itself were a substance, then it would have all the traits of a substance, and so substance and possibility would either both involve relations or both would not, but clearly that is not the case. So, for example, if one takes substances, such as humans, horses, oak trees, and the like, nothing more is needed to complete or perfect what this substance is or what is understood by it. To say, “*This* (pointing to a particular tree) is an oak (or more generally, a substance)” is a complete thought. In contrast, possibility is understood always and only relative to something; to say, “*This* (pointing to an acorn) is a possibility” is incomplete without some further reference, whether implicitly or explicitly, to that for or of which it is a possibility, namely an oak (or, for that matter, lunch for a squirrel, or ammunition for a slingshot, and so on). That is because an acorn is not possibly a human, a horse, or the like, but only possibly an oak. More generally, there is nothing that is just *a possibility* in the way there can be just a substance; rather, it is always *a possibility for . . .* whatever.

Moreover, continues Avicenna, possibility cannot be the substance-*cum*-relation, that is, the substance-relation complex. That is because possibility,



Avicenna insists, is simply the relative absence of some necessary existence. In other words, possibility is the privation or absence of some presently and actually existing thing. In contrast, the substance-relation complex is precisely something presently and actually existing. Thus, Avicenna concludes, possibility is not a substance in its own right, and consequently it must exist in a substrate.

In a very real sense, the core of Avicenna's analysis of possibility in itself is contained in his notion of possibility's being a certain privation or absence (*'adam*) relative to some necessary or actual existence, and so I should linger over it. Again, Avicenna has strenuously argued that there can only be one thing whose existence is necessary through itself, namely, the Necessary Existent. Everything else when it actually exists, though necessary through another, is merely possible in itself. Now, what distinguishes possible existents from the Necessary Existent could be either that they possess some positive aspect, which would then be some form of necessary existence that the Necessary Existent lacks, or they lack some necessary existence that the Necessary Existent possesses.

Clearly, no possible existent can possess some necessary existence that the Necessary Existent lacks, since the Necessary Existent of itself is that which lacks no necessary existence. In other words, it lacks nothing that would perfect its existence. Thus, that by which possible existents are distinct from the Necessary Existent is their absence or privation of some necessary existence, for any necessary existence that they have is in imitation of the Necessary Existent. Perhaps one model, then, by which to understand Avicenna's point about possibility—one, however, that Avicenna himself does not use—is to think of a "chain of being"<sup>16</sup> extending from the Necessary Existent to absolute and genuine nonexistence (*lā wujūd*) with varying degrees of privation or absence of some necessary existence in between. In this case, to be some species of possible existence in itself, then, is simply to lack some necessary existence and so to fall somewhere below the Necessary Existent on the chain of being while not being absolutely nonexistent.

As for why such and such a degree of privation should correspond with such and such a species of possible existence—such as being an Intelligence like the Active Intellect, or being a human, or being an oak tree—Avicenna is adamant that there can be no cause that explains this (*Metaphysics*, VI.1, 197.9–198.7). Certainly, there is a cause for why such a possible existent has whatever degree of necessary existence it has when it actually exists, namely, the Necessary Existent and any intermediary causes between it and the

Necessary Existent. Also, those things that come to be after not having existed for some time have causes for both their coming to be necessary when they do and not existing before that time, namely, the prior absence and then presence of the cause or causes of their necessary existence. Still, none of these are a cause for the privation or absence of the necessary existence that makes some possible existent the very kind that it is.

Does such a position mean that Avicenna thinks that possible existence stands alongside of necessary existence as a principle of creation? No. Avicenna constantly emphasizes, as I noted in both chapters 2 and 3,<sup>17</sup> that a principle is some positive causal factor that actively plays a role in the creation or change of a thing. A privation or absence of existence is nothing positive or active. It is merely something required if there is to be creation or change.<sup>18</sup> So, for example, it is impossible for *x* to change into *F* if it already is *F*, and so the privation of *F* is required for that particular change. That privation, however, is not some coprinciple acting alongside of the efficient cause to bring about the effect.

Similarly, it is impossible for the Necessary Existent to create something that is of itself necessary through itself (for something created, and so necessary through another, cannot become necessary through itself). Thus, whatever is created must lack some necessary existence inasmuch as it is part of the created order, and as such the privation or absence of existence, reasons Avicenna, is required by any act of creation. Is privation something in some sense? Yes. But it is not some existing thing that is a coprinciple alongside of the Necessary Existent acting to bring about the created order. At the end of this chapter, I shall return to this point. For now, however, it is enough to note that for Avicenna whatever exists possibly through itself, whether it is created atemporally or temporally, has through and of itself only the privation or absence of some necessary existence. Whatever necessary existence it has, it ultimately has through the Necessary Existent.

Still, one might object that Avicenna's analysis of possibility makes possibility too independent of the deity. Indeed, according to certain Islamic speculative theologians, the grounds for and explanation of possibility (*istiṭā'a*) is in fact the power (*qudra*) of an agent, for a thing is possible, so they maintained, only if the agent has the power to do or create it.<sup>19</sup> To clarify this suggestion more I should note that most Islamic speculative theologians were occasionalists and as such reserved all causal efficacy or agency for God alone.<sup>20</sup> Thus, the position of many Islamic theologians was that something is possible just in case God could do it.

Avicenna's response is to observe that God's power does not extend to what is impossible, but only to what is possible (*Physics*, III.11, 233.10–234.1; *Metaphysics*, IV.2, 139.13–140.6). Consequently, it does not speak ill of the divine power that God cannot make something that, for instance, involves a contradiction. Power, rather, is always referred to what is possible in itself.

Given that power has as its proper scope the possible in itself, Avicenna argues against explaining possibility in terms of power thus: If, as the theologians maintained, something is possible just in case God has the power to do that thing, then when one says that God is omnipotent and so has the power to do everything that is possible (a seemingly meaningful statement), all one is really saying is that God has the power to do everything that God has the power to do (a trivially true and thus vacuous statement). In a similar vein, if possibility is identical with the power of an agent, Avicenna continues, then a manifestly false statement, such as "I (Jon) have the power to do whatever is possible" turns out to be in fact a true statement, for I (Jon) do have the power to do whatever I have the power to do. In short, complains Avicenna, if possibility can be reduced to the power of an agent, one should be able to replace one term, whether "power" or "possibility," with the other *salva veritate*, and so preserve the truth value of any statement in which one or the other term appears, but in fact one cannot. In effect, ends Avicenna, without some independent notion of possibility, God's omnipotence itself becomes vacuous, since everything has the power to do whatever it has the power to do.

In then end, Avicenna maintains that possibility is merely the relative absence of some necessary existence. Whatever necessary existence a created thing has, it ultimately has from the Necessary Existent; whatever it lacks with respect to necessary existence it has through itself. Thus, in a very real sense when the Necessary Existent causes what is possible in itself to be necessary, it is creating *ex nihilo*, if by *ex nihilo* one means creating from no actually existing prior thing.

### The Possibility of What Comes to Be, Matter, and Forms

#### *The Possibility of Coming to Be*

In the preceding section, I considered Avicenna's general analysis of possibility as it applies to both what is atemporally and temporally created. Now,

I turn specifically to Avicenna's analysis of the possibility belonging to what is temporally created, that is, the creation of things that come to be after not having existed (*Physics*, III.11, 232.15–233.3; *Metaphysics*, IV.2, 136.9–138.8; *Salvation*, "Metaphysics," I.17, 536). Avicenna notes that whatever comes to be (*ḥādith*) must be either temporally or ontologically preceded by the possibility of its coming to be, for if there were no possibility for its coming to be, argues Avicenna, then its coming to exist as actual would be impossible. From the preceding section, one has seen Avicenna's arguments for why the possibility of coming to be could not be a substance in its own right. Thus, this prior possibility for coming to be must, according to Avicenna, inhere in a substrate.

This substrate can be either immaterial—whether uncreated, namely, the Necessary Existent, or a created immaterial being such as an Intellect—or material. I have already noted one of Avicenna's reasons for denying that the possible in itself is related to the Necessary Existent as its power, for such a suggestion, argued Avicenna, renders the notion of omnipotence vacuous. Sprinkled throughout Avicenna's corpus, one finds further reasons as well. For example, the Necessary Existent can in no way be a substrate or subject of something that is distinct from its very being. That is because the simplicity of the Necessary Existent would then be jeopardized, for there would be the Necessary Existent qua substrate and that thing that purportedly inheres in the Necessary Existent. Consequently, given that possible existence is clearly distinct from necessary existence, the Necessary Existent cannot both be absolutely simple, which Avicenna has argued that it is, and the substrate of possible existence.

It remains then that if possibility in itself inheres in an immaterial substrate, it would have to be one that is created and so possible in itself, such as a human intellect, or the Active Intellect, or the like. If that intellect is something that comes to be, like the human intellect, then the possibility of its coming to be must precede its actually coming to be. In that case, one finds oneself faced with the initial question: In what does the possibility of that intellect that comes to be inhere?

Avicenna next considers whether the possibility of coming to be could inhere in an intellect that is atemporally created, such as the Giver of Forms or Active Intellect (*Metaphysics*, IV.2, 138.4–139.1).<sup>21</sup> Avicenna grants that such an intellect does have the potential (*qūwa*) to produce the species forms of things that come to be after not having existed. So, for example, the Giver of Forms bestows the species forms that make up the various natural kinds here in the sublunar world. Still, continues Avicenna, the

Giver of Forms must either be producing these forms always or producing them at some times and not at others. If, on the one hand, it comes to produce them at some time after not having produced them, then one again has a case of something coming to be, namely, its producing some forms after not having produced them. In that case, the possibility of that production preceded its coming to be, and one again finds oneself at the beginning: In what does the possibility of producing some form after not producing it inhere? On the other hand, if the Giver of Forms is always producing the forms that make up the various kinds of thing in the sublunar world, then its influence is constant, and there is no explanation of why a given thing that came to be (call it  $x$ ) had not previously existed, given that the Giver of Forms was producing  $x$ 's form even when  $x$  was not existing. In short, there has to be yet some other factor than merely the production of forms to explain  $x$ 's coming to be after not having existed.

To sum up quickly: Since the possibility of what comes to be is not a substance, Avicenna argues that it must inhere in some substrate. That substrate could be either immaterial or material. It has already been noted why an immaterial intellect alone is not enough to explain the possibility of something's coming to be after not having been. Given that such possibility exists, and that it is not self-subsistent, but subsists in a substrate, and that this substrate cannot solely be something immaterial, Avicenna concludes:

We ourselves call the possibility of existence the potentiality of existence, and we call that which underlies the potentiality of existence in which there is the potentiality of the existence of the thing a "subject," "prime matter," "matter," and the like, on account of many different considerations.<sup>22</sup> Thus, matter precedes whatever comes to be (*Metaphysics*, IV.2, 140.15-17).<sup>23</sup>

When considering possibility in itself, it was seen that it is a certain relative notion, namely, the privation or absence of some necessary existence. It was also seen that it requires some substrate. While in the case of things that are atemporally (or eternally) created that substrate might be an immaterial intellect, in the case of those things that change from not having actually existed to actually existing, namely, those things that make up the sublunar realm in which we find ourselves, the substrate of their possibility is for Avicenna matter.<sup>24</sup> Thus, a full understanding of possibility, at least as Avicenna understands it, requires an analysis of the matter in which the possibility of temporally coming to be inheres.

### *Matter and Form*

I have already noted that for Avicenna there is among possible existents a division between those things that never exist separate from a subject, even though they are not themselves (material or formal) parts of the subject, namely, accidents, and those things that do not exist in a subject, namely, substances. Of these two classes, Avicenna argues, substances are ontologically prior. He reasons thus (*Metaphysics*, II.1, 45.9–13): Inasmuch as some accident exists in a subject, that subject too must be either an accident or a substance. Since Avicenna believes that it is impossible that some determinate thing, such as a wren, a robin, or the like, should have an infinite number of subjects presently existing in it, the series must terminate with that which itself is not in a subject. As has been seen, for Avicenna it is substance that is not in a subject. Consequently, the series of accidents terminates at a substance, which is the ultimate grounds for the rest of those things in the series, and so substance is causally prior to accidents.

Again, then, a substance is that which does not exist inseparably from a subject and is not a part of the subject; however, Avicenna also distinguishes between a subject (*mawḍūʿ*) and a substrate or locus or receptacle (all various translations of the Arabic *maḥall*) (*Metaphysics*, II.1, 46.18–47.10). A subject, on the one hand, he tells us, is that which subsists in itself inasmuch as it has been specified to some determinate species, and as such is a cause for the subsistence of those things inhering in the particular instance of that species. A substrate, on the other hand, is anything in which something inheres or is established, and, through that thing, the substrate comes to be in some state. In this respect, then, a substrate, locus, or receptacle is more general than a subject, since while things may inhere in either a subject or a substrate, a subject must already subsist as some species of thing, such as a human or a horse, while such a specified existence need not be the case with respect to a substrate.

Bearing this distinction in mind, Avicenna claims that both matter and forms—in the strict sense of species forms,<sup>25</sup> such as the form of humanity or equinity (and so not accidental forms, such as the form of heat)—are both substances. Matter clearly is a substance on the present definition since it is not in another, as in a subject, but is the ultimate substrate of all material forms. Equally clear is that the immaterial forms of the Intelligences are not in a subject and so are substances. As for the various material species forms that are in a substrate, namely, species forms such as those of human,

horse, oak tree, and the like, they are not strictly speaking in a subject, since the matter only exists as specified, and so as a subject, owing to the presence of that very species form existing in it. As for the composites of matter and some species form, for Avicenna they too are substances, since they are the subjects of the various accidents or accidental forms that exist in that composite.

Although material species forms require matter as that in which they inhere, matter also requires species forms in order to subsist. In fact, argues Avicenna, matter can never be completely devoid of some form or other, a thesis we saw him merely assert in his *Physics*, but now he demonstrates. While at *Metaphysics*, II.3 he provides a number of arguments for this thesis, the general move is this: If matter—again understood as the most basic substrate underlying all forms—were ever completely stripped of every form, then it would be something completely devoid of any magnitude; for magnitude is an accidental form belonging to a substance. Moreover, matter could not occupy any space, or be continuous and divisible, since all of these states follow upon some quantitative or positional form. While an existence separate from these quantitative and positional states might be fitting for an *immaterial* substance, they would, in effect, render matter as a substance nil. In the end, argues Avicenna, if matter is to subsist at all, it requires some species form qua species form (*Physics*, I.2, 14.1–15.5; *Metaphysics*, II.4). In other words, the subsistence of matter does not depend upon any particular species form, such as that for dolphins, orangutans, or maples; it just needs some species form or other. Consequently, inasmuch as matter depends upon forms, forms are the cause of matter's subsistence.

As for the subsistence of the forms themselves, clearly the cause of their subsistence cannot be the matter, argues Avicenna, for such a state of affairs would involve circular causation. That is because the actual existence or subsistence of matter is, as has just been seen, the effect of a form, and an effect that subsists through some cause cannot be the cause of its own cause's subsistence (*Metaphysics*, II.4, 70.11–16). The cause of the forms' subsistence is instead for Avicenna that entity that bestows the various species forms onto the properly prepared or disposed matter, namely, the Giver of Forms. Finally, with respect to the subsistence of composite substances, such as this particular human or that particular dog, it is the form and matter together that are the causes for its existence.

Quickly to recapitulate, the possibility of something's coming to be after not having been is for Avicenna a relational notion: It refers to the relative

absence of some necessary existence. Inasmuch as this possibility is relational, it requires some substrate in which to inhere. Avicenna identifies this substrate, at least in the case of things that come to be after not having been, with matter. Matter, again, is a substance (for it is the substrate of all species forms), and so can function as a substrate for the possibility of what comes to be. Still, it is a substance whose existence is tenuous and requires some species form to make it subsist. Without some form or other matter would fall into nonexistence along with the possibility inherent in it.

### Causality

Before turning to Avicenna's arguments for the eternity of the cosmos, I still need to consider the notion of causality at work in his philosophical system, for not only will such a discussion round out Avicenna's understanding of the cosmos, but certain features of his notion of causality are also central to one of his arguments for the world's eternity.

In addition to form and matter, Avicenna, following a long Aristotelian tradition, identifies two further causes: efficient cause (or the agent) and final cause (or the end) (*Metaphysics*, VI.1; *Salvation*, "Metaphysics," I.12). Avicenna again defines the formal cause as that part of a subsisting thing by which that thing actually is what it is, while the material cause is that part of a subsisting thing by which that thing potentially is what it is and in which the potentiality of its existence resides.<sup>26</sup> The final cause or end is that for the sake of which the existence of something distinct from the cause is realized. As for the efficient cause or agent, Avicenna defines it as that which provides or bestows some existence essentially distinct from its own.<sup>27</sup>

Avicenna additionally distinguishes between the "natural efficient cause," and what might be termed the "metaphysical efficient cause." The natural efficient cause merely produces motion, whether with respect to the category of quantity (as in the case of augmentation or diminution such as growing or deteriorating in size), or quality (as in alteration such as heating and cooling), or place (such as locomotion), or position (such as rotating in place). In contrast, the metaphysical efficient cause produces existence or being itself, either by producing existence absolutely (as in the case of the Necessary Existent) or producing the various species forms that give a specific existence to matter (as in the case of the Giver of Forms). Natural



efficient causes then are efficient causes in the sense that they bring about the existence of certain motions or changes in some material subject or substrate. As such, natural efficient causes play the role of preparatory causes that dispose and prepare the matter by either moving it to some suitable place or altering certain qualitative features of the matter, rendering it receptive to the influence of a metaphysical efficient cause, which in its turn bestows the species form by which the substance is the kind that it is.

According to Avicenna's conception of causation, when the entire causal complex actually exists, that is, there actually is suitably disposed matter and a metaphysical efficient cause imparting a given form for some good, the effect of this causal complex cannot but occur. In other words, for Avicenna there can be no temporal gaps between so-called essentially ordered causes and their effects. Here, an "essentially ordered cause" is any cause that the particular effect essentially depends upon right now in order to exist, as, for example, I depend upon the form of humanity informing matter right now if I am to exist at this moment as a human. In this respect, my dependence upon form and matter for my existence is, for Avicenna, different from my dependence upon my so-called temporally ordered causes, like, for example, my dependence upon my father and mother for my existence. Essentially ordered causes must exist simultaneously with their effect, whereas temporally ordered causes need not.

One argument that Avicenna gives in his smaller encyclopedic work, the *Salvation*, for this thesis (namely that essentially ordered or metaphysical causes must exist simultaneously with their effects) comes from his notion of necessity (*Salvation*, "Metaphysics," II.1). One characteristic of necessity is that its opposite implies a contradiction. Thus, assume a certain proposition. If that assumed proposition entails a contradiction, then the initial proposition's opposite must be necessary. Such a situation holds for all modes of necessity, including what is necessary through another at the time that it actually exists. That is because one cannot, without contradiction, assume that something, when it is necessary through another, does not actually exist, since this is to assume that something, when it actually exists, does not actually exist.

In like fashion, argues Avicenna, to assume that causes do *not* necessitate their effects leads to an explicit contradiction. Here, an example will make the point. From repeated observations, Avicenna believes that one can infer that fire has the active causal power to burn, and that cotton has the passive power to be burned. So, let fire, and all the active causal powers required

for burning, be put in contact with cotton along with all the passive causal powers required for being burned. Now assume that the expected effect, the burning of the cotton, does not occur. In this case either one of two things could explain why the cotton is not burning. Either that which has the active causal power to burn, namely, the whole complex of requisite active causal powers, does not have the active causal power to burn, which is clearly a contradiction—for all of the requisite active causal powers cannot simultaneously have and not have the active power to burn. Or, *mutatis mutandis*, that which has the passive causal power to be burned, namely, the whole complex of requisite passive causal powers, does not have the passive causal power to be burned, and there again is a contradiction. In general terms, then, the assumption that the effect is not necessitated by its causes when all the causes are present leads to an explicit contradiction; however, in that case, concludes Avicenna, its opposite must be necessary, and so causes must necessitate their effects.

In a similar vein, Avicenna also believes that the efficient cause of a thing's existence must exist simultaneously with its effect and must continue to exist as an efficient cause as long as the effect exists. Now, it is common to think that the efficient cause is only required to bring something into existence. Thus, one might believe that once a given thing comes to exist it no longer needs an efficient cause but can subsist on its own—as, for example, the parents are efficient causes of their offspring, and yet the offspring, once born, continue to exist even should the parents pass away.

Avicenna in contrast argues that such a conception of the efficient cause is misguided. He reasons thus (*Metaphysics*, VI.1, 198.8–9.16): After something,  $x$ , comes to be (*ḥudūth*), it exists, and, according to Avicenna's modal ontology, that continued existence is either one of (I) possible existence (and so is necessary through another) or (II) necessary existence. As for (I)—again that  $x$ 's continued existence after coming to be is merely possible existence—prior to  $x$ 's coming to exist the only thing that one could really or truthfully say about  $x$  is that  $x$  does not exist. In other words,  $x$  considered prior to its coming to be is nothing more than the absence or privation of some necessary or actual existence, which again is just what it means to exist possibly in itself. Consequently, if  $x$ 's existence after it comes to be remains mere possible existence in itself, there has been no change in the mode of existence attributed to  $x$ ; it still remains as only possibly existing. Yet the mode of  $x$ 's existence is exactly what changes when  $x$  comes to be after not having been. Moreover, inasmuch as possible existence is related to

nonexistence, possible existence cannot be the cause of  $x$ 's continued existence after  $x$  comes to be, for nonexistence, even relative nonexistence, cannot, for Avicenna, cause anything.

If, (II),  $x$ 's continued existence is necessary, then it is either (II.a) necessary through itself or (II.b) necessary through another. Obviously,  $x$ 's continued existence, which came to be after not having been, is not (II.a) necessary through itself, for inasmuch as it came to exist after not existing,  $x$  is something whose existence is possible in itself. Nothing for Avicenna can simultaneously be necessary in itself and possible in itself, nor, as was argued in the previous chapter, can something be a necessary existent through itself and through another.<sup>28</sup> Hence, if  $x$ 's continued existence is necessary, it must be (II.b) necessary through another. That other, Avicenna goes on, might be (II.b.1) the very act of coming to be, (II.b.2) some attribute belonging to the essence of  $x$ , or (II.b.3) something distinct from  $x$ . The very act of coming to be (II.b.1) cannot be that other that is presently causing  $x$ 's continued necessary existence, since the very act of  $x$ 's coming to be ceased once  $x$  actually comes to exist. What does not exist, which in this case is the coming to be of  $x$ , cannot presently exist as the cause of  $x$ 's continued necessary existence.

If that other by which  $x$  continues to exist is some attribute of  $x$ 's own essence (II.b.2), then that attribute, inasmuch as it exists, is (according to Avicenna modal ontology) either (II.b.2.i) necessary in itself or (II.b.2.ii) necessary through another. Now, if (II.b.2.i) one of the attributes of  $x$ 's essence is that it is necessary in itself, then  $x$ 's existence would be necessary in itself (for it would have necessary existence essentially). Again, however,  $x$  is something existing possibly in itself but is necessary through another. If (II.b.2.ii), the attribute comes to exist together with the coming to be of  $x$ , then the initial question can be asked of the attribute, "Is that attribute's continued existence one of necessary or possible existence?" and one finds oneself in an explanatory circle. Thus, (II.b.3),  $x$ 's subsistence, that is, its continued existence once it comes to exist after having not existed, must be due to some cause distinct from  $x$ . For Avicenna, then, the proximate (metaphysical) efficient cause for the subsistence of species forms—namely, those forms that make up the simple and composite substances of the sublunar realm—is the Giver of Forms, whereas the remote and ultimate cause sustaining the existence of the entire universe of things possible in themselves is the Necessary Existent. One now has all the elements to understand Avicenna's arguments for the eternity of the world, and in fact why he thinks it is irreligious to think otherwise.

### Avicenna's Modal Arguments for the Eternity of the World

Avicenna presents various arguments for the eternity of the world both in his *Physics* (III.11) and his *Metaphysics* (IX.1). In general, all of his arguments are variations on proofs that had been formulated in the Greek world, except all are now given a uniquely Avicennan stamp. Thus, the first of his arguments that I consider is based upon Aristotle's argument that generation requires matter and forms, except now Avicenna begins with his analysis of possibility that has been discussed. Avicenna's second argument draws upon Aristotle's proof from the nature of time, but now exploiting Avicenna's own analysis of time in terms of possibility. Finally, the last argument is a version of Proclus's argument drawn from the nature of the creator, but in this case Avicenna appeals to his own conception of causality, which, as has just been seen, is heavily imbued with his modal ontology.

#### *The Modal Proof from the Nature of Temporally Created Things*

Avicenna's first argument is a *reductio*-style argument (*Physics*, III.11, 232.14–230.12; *Metaphysics*, IX.1, 300.7–302.10; *Salvation*, "Metaphysics," II.22, 604–608). Here he assumes that the cosmos came to exist at some finite time in the past "before" which there was only God. (He leaves open the possibility that "before" here might be taken in a nontemporal sense.) Still, before the cosmos came to exist, its existence, which includes the sub-lunar realm of material species forms and matter, had to be possible in itself. If the existence of the cosmos were not possible in itself, then it would have to be either necessary in itself or impossible in itself. Inasmuch as the cosmos has purportedly come to be after not having been, it cannot be necessary in itself. Also, it cannot be impossible in itself, since what is impossible never exists, and the cosmos clearly exists.

Thus, since the existence of the cosmos—understood as a composite of both immaterial and material forms as well as the matter in which material forms inhere—is something possible in itself, that possibility, asserts Avicenna, must precede the coming to be of the cosmos. Moreover, when considering the possibility of existents that temporally come to be after having not existed, such as individual animals, plants, and the like, it was

noted that possibility is not a substance in its own right, but requires some substrate. It was further noted that matter must be that substrate for those existents that temporally come to be. Consequently, assuming that the cosmos—again understood as the composite of forms and matter—were temporally created in the finite past, matter, Avicenna observes, would have existed prior to its own creation, which is absurd.

Moreover, matter, as Avicenna has argued, cannot subsist considered merely as the indeterminate substrate of what might possibly exist; rather, matter needs some species form through which it subsists, the cause of which is ultimately traced back to the Necessary Existent. Thus, should the cosmos have been created in the finite past, forms also would have had to have existed prior to their creation, which, again, is absurd. In short, the possibility to create the world exists only as long as the matter exists, and the matter actually exists only when it is being in-formed. The possibility of the cosmos' existence, however, maintains Avicenna, has eternally existed. Thus, the form-matter composite, which is the cosmos itself, has eternally existed, albeit eternally dependent upon the Necessary Existent as its ultimate (metaphysical) efficient cause. What is important to note about Avicenna's version of Aristotle's argument is that while it makes the forms and matter that make up our cosmos everlasting, and so the cosmos has always existed, unlike Aristotle's earlier argument it also makes the forms and matter of the cosmos eternally dependent upon the Necessary Existent as their efficient cause.

### *The Modal Proof from the Nature of Time*

Avicenna's second modal proof for the eternity of the world is derived from the nature of time (*Physics*, III.11, 238.15–39.8; *Metaphysics*, IX.1, 304.8–307.6; *Salvation*, "Physics," II.9, 228–230). Time for Avicenna, as I noted when considering his temporal theory,<sup>29</sup> corresponds with the possibility to traverse longer distances or a greater number of rotations when two things move at the same rate of speed. Now, again as part of a *reductio*-style argument, Avicenna assumes that the universe is temporally finite—for example, it was created 10,000 years ago (where a "year" corresponds with a single apparent solar rotation as we would measure it now). In this case, it still would have been possible, maintains Avicenna, for the Necessary Existent to have created a greater number of solar rotations than it purportedly did, for example, 20,000 rotations. (Since Avicenna identifies the Necessary

Existent with God he thinks it would be sacrilege to deny otherwise.) Moreover, continues Avicenna, it could have been possible for the Necessary Existent to create the extra 10,000 possible rotations such that 20,000 solar rotations would have elapsed up to the present day. Simply put, there is the possibility for the universe to have undergone a longer motion in the past than it purportedly has.

If, however, there is a possibility for the Necessary Existent to have created a greater number of solar rotations than it purportedly did, there must have been a time when the Necessary Existent was not creating the world. For again on Avicenna's analysis of time, time is just the possibility for uniformly moving objects to cover greater distances or more rotations. In other words, assuming that Avicenna's analysis of time is correct, simply affirming the existence of some possibility for certain earlier rotations, and so the possibility of a longer motion, is to affirm the existence of time. There is no illicit modal shift here. Inasmuch as one is a modal realist and believes that possibilities exist as real features of the world, and time corresponds with a certain possibility itself—a premise that, as was seen in chapter 3, followed from certain basic kinematic facts—then the inference from the existence of this real possibility, to time's real existence is a valid one. Consequently, within Avicenna's framework, he is completely justified in arguing that given the mere possibility that the cosmos could have undergone changes and motion longer than it purportedly has, and that the possible length of these changes could be indefinitely large, then time must have always existed reaching into the infinite past and will always exist reaching into the infinite future inasmuch as time corresponds and in fact is for Avicenna identical with the very possibility for these indefinitely long motions.

Given this conclusion, Avicenna can now repeat Aristotle's proof for the eternity of the world from time but again with his modal twist. That argument was that if there were a first moment in the finite past when the cosmos either began to move or was created, there would have been a time before that purported first moment. Whereas Aristotle simply took this premise as some undemonstrated first principle, Avicenna has provided an independent proof for it from his modal analysis of time. Avicenna then observes that when there is a time, there must also be a motion, for motion is the very subject in which time inheres and has its existence. If there is motion, however, there must be something undergoing the motion, namely, a form-matter composite, which again Avicenna identifies with the cosmos

itself. Consequently, if one assumes that the cosmos—again a composite of forms and matter—were created at some moment in the finite past, one would be committed to the existence of forms and matter, when forms and matter purportedly did not exist. The conclusion is absurd, so the assumption that gave rise to it, namely that the cosmos was created in the finite past, concludes Avicenna, must likewise be absurd. Avicenna concludes that even though it is true that the cosmos is causally dependent upon the Necessary Existent, and so the Necessary Existent is the creator of the universe, the divinity has from all eternity been creating it.

*Proof from the Nature of Causation and  
the Necessary Existent*

Again Avicenna's third argument is a variant of Proclus's proof, namely that, since the divinity creates from its eternal goodness and that goodness never changes, it has been eternally creating (*Metaphysics*, XI.1, 302.11–304.6; *Salvation*, "Metaphysics," II.23, 609–612). Recall that by the time of the medieval Islamic period, thinkers on both sides—whether for or against an eternal creation—wanted to make God both the final and efficient cause of the cosmos' existence. Again, however, on Avicenna's analysis of causation, the effect must be necessitated simultaneously with the existence of the effect's complete cause. For Avicenna there simply are no temporal gaps between a complete complex of essentially ordered, or metaphysical, causes and its effect. Thus, if the Necessary Existent exists, whatever proceeds from it as its effect must also exist. Were it the case, then, that the Necessary Existent were to exist and yet the cosmos were not to exist, the Necessary Existent could not be the complete efficient cause of the cosmos given Avicenna's account of causality.

In that case, continues Avicenna, something else,  $x$ , which completes the causal complex, must have come to exist that previously had not existed, as, for example, a will to create. Whatever  $x$  might be, it either comes to be in the Necessary Existent itself or not. If it does not come to be in the Necessary Existent itself, then the question concerning the cause of  $x$ 's coming to be still stands, for the Necessary Existent is assumed to be the complete cause of all things, and  $x$  supposedly came to be after not having been. If  $x$ , whatever it is, comes to be in the Necessary Existent, then the Necessary Existent has changed, and has come to have some existence that it did not previously have. The Necessary Existent, as Avicenna has argued frequently,

exists necessarily in every respect, so it cannot change in any way. Thus, this option is false. Simply put, inasmuch as the Necessary Existent is the eternally unchanging complete cause of the cosmos' own necessary existence, and since effects must exist simultaneously and together with their complete causes, the cosmos, maintains Avicenna, must exist eternally as something necessary through the Necessary Existent.

With these three arguments, one sees Avicenna rehabilitating certain classical arguments for the eternity of the world, however, doing so in such a way as to avoid the objections raised against their classical predecessors. Thus, none of Avicenna's arguments presupposes that there was a time before creation. In fact, Avicenna's second argument, far from presupposing that there has always been time, provides a proof for that claim. Similarly, unlike Aristotle's argument based upon his analysis of generation, and the assumption that generation presupposes forms and matter, Avicenna's variant starts from the even more basic notion of the very possibility of there being generation and coming to be. Similarly, Avicenna's final argument draws heavily upon his modal ontology for its conception of both causality and the divine nature.

### Infinity and the Possibility of an Eternal World

Despite Avicenna's Herculean efforts, until he can counter the absurdities that Philoponus raised against the notion of an infinitely extended past, the temporal and eternal creationists' positions are, at best, at a standstill. Again, the objections that Philoponus presented followed upon certain strongly held intuitions about infinity, such as it cannot be traversed and that there cannot be an actual infinity. Philoponus, as I noted, had two lines of criticism: One, an eternal world would entail that an actual infinite has come to exist and so an infinite has been traversed and; two, there would be sets of infinities of different sizes, and so sets larger than that beyond which there is nothing more.

Philoponus, like many others, took it as simply self-evident that an infinite could not be traversed. In stark contrast, Avicenna, as far as I am aware, nowhere outright denies that an infinite can be traversed absolutely.<sup>30</sup> Instead, when Avicenna mentions the impossibility of traversing the infinite at all, it is always in a qualified way: An infinite cannot be traversed *in a*



*finite period of time.*<sup>31</sup> Without this qualification, Avicenna sees no problem with traversing an infinite, again provided that there is an infinite amount of time to do so. In fact, in his *Metaphysics* as part of a response to Philoponus, he quite explicitly maintains that not only is it possible to traverse an infinite temporal causal chain, but, in fact, it is necessary.

We do not preclude an infinite [number of] ancillary and preparatory causes, one [temporally] preceding the other. In fact, that must necessarily be the case, since each temporally created thing has become necessary after not having been necessary because of the necessity of its cause at that moment . . . and its cause also having become necessary. So with respect to particular things, there must be an infinity of antecedent things by which the actually existing causes necessarily come to be certain actual causes of [the particulars] (*Metaphysics*, VI.2, 202.7–10).

In this passage Avicenna is explaining why a given temporal event or thing comes to be at the time that it does and not earlier, where the reason is that the matter was only prepared to take on a new form at that time.<sup>32</sup> As such, there must have been temporally prior causes that prepared the matter, but of course those temporally prior causes are also temporal events or things, which themselves need temporally prior causes, and so on ad infinitum. Thus, according to Avicenna, an infinite number of temporally prior preparatory causes must have been traversed.

While for all intents and purposes Avicenna's claim here is nothing more than a restatement of Philoponus's original objection that an eternal past would entail the traversal of an infinite, the onus of proof has changed. Since Avicenna believes that he has demonstrated that the cosmos is eternal, and so an infinite has been traversed (albeit it has had all the infinite time in the past to do so), he is now challenging Philoponus and those of like mind to demonstrate that the traversal of an infinite is impossible. If they cannot, and one, like Avicenna himself, is willing to accept that in an infinite amount of time an infinite can be traversed, then one of Philoponus's objections collapses.

Recall, however, that Philoponus had a follow-up objection, namely that the traversal of an infinite, even if all the members are not currently present, still entails that an actually infinite number has been realized, and an actual infinite, no matter how construed, is impossible, or at least Philoponus would have one believe. In the *Physics* (II.11, 238.3–15), Avicenna responds, complaining that Philoponus fails to appreciate the distinction between

“each one” (*kull wāḥid*) and “whole” (*kull*). So, for example, while it is true that each one of the parts of a thing is a part, it is false that the whole of that thing is a part. Similarly, contends Avicenna, while it is possible that each one of an actual infinite has existed, it need not be possible for the whole of that infinite to exist as a whole.

In fact, using the each one/whole distinction, Avicenna argues that the whole of all past events is not, as it were, collected together into an actually existing set (*jumla*) (ibid., 237.13–238.2).<sup>33</sup> At best, he observes, they have been collected together in some intellectual depiction (*waṣf al-‘aql*). A collection in an intellectual depiction, however, is only equivocally like a collection existing in reality or extramentally, which is a genuine set, for the collection of all animals as a logical notion existing in the intellect, Avicenna points out, is “decidedly not the set of them [existing extramentally]” (ibid., 238.2). Of course, if something does not exist, then it is inappropriate to say that it is actually any thing, at least in any proper sense of “actual.” Thus, concludes Avicenna, it is simply unforgivable to speak of the set of past events as actually infinite, for no such set exists.

Using the same strategy, Avicenna further addresses Philoponus’s objection about the rotations of the planets and greater and smaller infinities (ibid., 236.14–237.12). Again, there is no actually existing infinite set of rotations; rather, Avicenna reminds us that they are said to be infinite in that “whatever number our estimative faculty imagines to belong to the motions, we find a number that was before it” (ibid., 237.2). As for the whole set of rotations, that does not exist. Now, continues Avicenna, notions such as “more” and “less” as well as “finite” and “infinite” either apply or do not apply to nonexistent things. If they do not apply to nonexistent things, then the objection disappears, whereas if such terms do apply, then, chides Avicenna, they must equally apply to the infinity of future rotations that will occur. Since most defenders of the world’s past temporal creation, in fact, conceded that future time will be infinite, they find themselves, as it were, hoisted on their own petard.

In the end, Avicenna believes that all the arguments against the eternity of the world, based upon certain presumed absurdities following on the notion of infinity, depend upon undemonstrated intuitions that we have about the infinite.<sup>34</sup> Since Avicenna believes that he has truly demonstrated the eternity of the world, he is willing to set aside all of these undemonstrated assumptions about the infinite. In this respect, Avicenna, like Cantor centuries later, should be praised for recognizing that deeply entrenched intuitions about infinity can be demonstrated to be simply wrong.

## The Emanation of the Cosmos

In this chapter and the preceding one I have considered how Avicenna envisions the Necessary Existent in itself as both the final and efficient cause of the existence of an eternally enduring cosmos. Before turning to the emanation schema that Avicenna develops to explain the "causal mechanism" by which the Necessary Existent creates the cosmos, I should briefly mention how he (and indeed virtually all thinkers working during the ancient and medieval period) envisioned the topography of the cosmos.

### *Emanation and the Cosmos*

For those working within the classical physics and astronomy of Aristotle and Ptolemy respectively, the Earth is roughly at the center of the universe.<sup>35</sup> The sublunar realm includes the four elements earth, water, air, and fire, where these elements are understood in terms of their various rectilinear motions. So, for example, the element earth tends down toward the center, while the element fire tends up toward the sphere of the Moon, with water and air moving in a straight line toward places intermediate between those of earth and fire.

Since the Moon, Sun, planets, and stars were believed to move not rectilinearly but circularly, it was thought that they involved some yet different material or element, the so-called quintessence or ether. These celestial spheres (sing. *falak*) were in their turn thought to rotate approximately around the Earth. The number of celestial spheres is finite, since most medieval thinkers argued that the space of the cosmos is itself finite, ending with the outermost celestial sphere. The number of spheres included that of the Moon, those of the two inner planets, Venus and Mercury, the Sun, and the rest of the observable, outer planets, Mars, Jupiter, and Saturn. In addition to the planets there was the sphere of the fixed stars and the outermost sphere, which was needed to account for the procession of the equinox. Further spheres were postulated as needed in order to account for such phenomena as retrograde motion.<sup>36</sup>

Now, just as in the sublunar realm, the circular motion of these celestial bodies does not belong to them qua (ethereal) body. Instead, each celestial sphere needs some proximate mover, which, Avicenna concludes, after a lengthy discussion (*Metaphysics*, IX.2), cannot be merely the nature or form

of the celestial body but must be a soul. In addition, Avicenna argued that associated with each of the celestial sphere-soul composites there is also a completely immaterial Intellect or Intelligence that is the cause of the soul and the celestial body. Any given Intellect is itself produced by whatever Intellect is causally above it, with all the Intellects forming a causal chain that terminates with the Necessary Existent as the ultimate cause of everything below it.

As for how the Necessary Existent causes the existence of what is under it, Avicenna appeals to the Greek Neoplatonic theory of emanation or overflowing (*fayadān*). According to the emanationist schema, there overflows from whatever is perfect a certain secondary activity. For example, light emanates from the Sun, and heat emanates from fire; light and heat are not identical with the Sun and fire but are the effects of the Sun and fire given what the Sun and fire are. Unfortunately, the analogy is not exact: All of these examples are of natural or physical processes, which occur as a matter of natural necessity, whereas emanation in the case of the Necessary Existent proceeds, according to Avicenna, and as I shall explain soon, voluntarily. Thus, in the case of the Necessary Existent, since for Avicenna it is not merely perfect but above perfection, necessary existence itself proceeds from it, albeit voluntarily.

Since the Necessary Existent is absolutely simple, however, Avicenna does not think that it can be the direct or immediate cause of the necessary existence belonging to all the various Intellects and different kinds of possible existents below it (*Metaphysics*, IX.4, 328.5–330.4). That is because inasmuch as these possible existents represent different kinds of created things there would have to be different causal facets in the Necessary Existent to explain the multiplicity of diverse things proceeding from it, were it the direct and immediate rather than ultimate cause of all of the various existents below it. Instead, argues Avicenna, from something absolutely one only one thing comes. Still, all the complexity that is in the cosmos is in the Necessary Existent but again in a unified and noncomposite way. So, while the following analogy is far from exact, the noncomposite complexity of the Necessary Existent might be likened to the kernel of an acorn that, although it is homogenous throughout, nonetheless contains all the complexity and information that manifests itself in the various and diverse aspects of the mature oak tree.

Still, the problem of explaining how the Necessary Existent can be the ultimate cause of the apparent multiplicity in the cosmos remains. For if the

first Intellect that proceeds from the Necessary Existent is one, then, given Avicenna's principle, what proceeds from it should also be one. The emanationist schema, then, seemingly cannot explain how it is that from one emanated Intellect there can emanate three things: the Intellect below it, as well as its own associated soul, and the celestial sphere (for such an emanation appears to violate the dictum that from one only one proceeds). The situation only becomes that much graver when one tries to explain how the multiplicity of the sublunar realm came to be.

Avicenna's modal ontology yet again provides him with a neat solution to this problem of medieval cosmology. From the Necessary Existent there emanates for Avicenna the Intellect associated with the outermost celestial sphere. This Intellect must itself already be composite, for it is something possible in itself but necessary through another. Now, continues Avicenna, when this Intellect contemplates the Necessary Existent, there emanates from that first Intellect another Intellect—let this second Intellect be the one associated with the fixed stars. In addition to contemplating the Necessary Existent, the first Intellect also contemplates itself, but, as has already been seen, it is something composite consisting of its own possible existence and the necessary existence it has from another. Thus, according to Avicenna's own unique emanative scheme, when the first Intellect contemplates itself as something merely possible in itself, there emanates from it a certain celestial body, whereas when it contemplates itself as necessary through another, it emanates that celestial body's soul. This process continues at the level of the second Intellect. Now, however, the second Intellect contemplates its relation to the first Intellect and the Necessary Existent. This emanative process continues cascading downward with new Intellects, souls, and celestial bodies being produced until it reaches the Active Intellect or Giver of Forms, which is the Intellect that produces the Moon and lunar soul.

At this level, the Active Intellect or Giver of Forms, with its associated degree of possible existence and so privation, is simply incapable of emanating a single unified existent. Instead, a multiplicity of forms overflows from it that are incapable of subsisting on their own as the immaterial intellects do, and so these forms require matter in the way discussed earlier. That such a multiplicity should result is almost entailed by Avicenna's analysis of possibility in terms of the absence or privation of necessary existence, and the close association that the Neoplatonizing Aristotelian tradition finds between existence and unity. For as there is a greater and greater falling

away from or absence of necessary existence so there would be for ancient and medieval thinkers a greater and greater loss of unity. Still, as for why the loss of unity should lead to multiplicity where it does, there can be for Avicenna no causal explanation. That is because at this point one reaches the possible existents that are forever coming to be, and, as we have seen Avicenna argue, there is no cause for why a certain degree of privation should correspond with the possible existent with which it does.

### *Emanation and the Necessary Existent*

As for why the Necessary Existent should create the cosmos, Avicenna is adamant that it simply cannot be because of some cause other than the Necessary Existent itself. Thus, at book IX.4 of the *Metaphysics* of the *Cure* Avicenna states:

It is impossible that [the Necessary Existent in itself] should in any way have some principle or cause—whether [the cause be] that from which, concerning which, by which, or for the sake of which—such that it would exist on account of a certain given thing. Because of this, it is impossible that the being of the cosmos should result from [the Necessary Existent in itself] in a way that there would be some intention (*qaṣd*)—like our intention—for its generating the cosmos and for [the cosmos'] existence such that [the Necessary Existent in itself] intends [its generation] for the sake of something other than itself (*Metaphysics*, IX.4, 326.10–13).

The reason why Avicenna believes that the Necessary existent cannot intend the creation of the cosmos is because it would introduce multiplicity into the divinity, a pitfall, as has been noted, that Avicenna goes to great lengths to avoid. He enumerates the multiplicity that intention would entail thus (*ibid.*, 326.14–16): First, there will be something in the Necessary Existent that is the cause of its intending, namely, its knowledge that the intention is necessary, desirable, or there is some good in it; second, there would be the act by which the intention is acquired; third, and finally, there would be that which is acquired by acting for that intention. All of this Avicenna believes is simply absurd, given that the Necessary Existent is absolutely simple.

Thus, Avicenna concludes that the Necessary Existent does not intend (*qaṣd*) the existence of the world, but he is also quick to add that neither does that which proceeds from the Necessary Existent proceed by nature,

that is, by necessity. Avicenna's general argument at this point is to assert that there are two conditions that guarantee that a given act is *not* by nature: One is that there is a recognition (*ma'rifa*) on the part of the agent that it is performing that act, and the other is that the act involves the consent (*riḍā*) of the agent.

First, argues Avicenna, the Necessary Existent obviously recognizes that the existence of the cosmos emanates from it, since it exists as a pure intellect intellecting itself, as seen in the last chapter. Thus, there is nothing about its existence that it does not know or recognize. Second, continues Avicenna, the created order emanates from the Necessary Existent with its consent because consent, according to Avicenna, occurs (1) when one knows what proceeds from oneself, and (2) when there is nothing that hinders or interferes with that procession. Consequently, since, as has been seen, the Necessary Existent knows what proceeds from itself, and nothing causally acts on it so as to interfere with what proceeds from it, emanation, that is, divine efficient causality, must for Avicenna be at the consent of the Necessary Existent. Consequently, he concludes, the emanation of existence from the Necessary Existent is not by nature but through divine will or volition (*irāda*).

While there is certainly something paradoxical in saying that while the Necessary Existent does not intend the creation of the cosmos, it nonetheless wills it, the paradox, at least for Avicenna, is merely one of semantics. For Avicenna, there is a distinction between intention (*qaṣd*) and volition (*irāda*), namely, the contrast between the way that humans will or intend something because we need some good other than ourselves, and the way that the Necessary Existent wills something, where nothing is willed or wanted except for the good that is the very existence of the Necessary Existent.<sup>37</sup> To elaborate this point, Avicenna insists that the good that the Necessary Existent knows and wills in its emanative act is nothing other than its very self or very being, in Arabic its *dhāt*. In other words, it knows itself as the Necessary through itself; it knows that it is good; and knowing that it is good, it wills its existence. Here, Avicenna is just reiterating in a different way the claim that I noted in the previous chapter: The Necessary Existent is a self-explaining entity.

Now, according to Avicenna, in knowing itself the Necessary Existent knows, in one simple intellectual perception, the order of the good with respect to existence (*niẓām al-ḵayr fī l-wujūd*) (ibid., 377.9). Moreover, to know this good is for the Necessary Existent to will this good, for again to

will is for Avicenna just to act knowingly and not be hindered from so acting. Indeed, it is this knowledge of itself as the pure good that is the cause of the existence of whatever it knows. Finally, the existence of what it knows in no way completes, perfects, or benefits the Necessary Existent; rather, maintains Avicenna, it is only the created existence, which results from the Necessary Existent's knowing itself, that is completed, perfected, and benefited. In the human act of intending or willing, in contrast, there is always (1) some external good willed or intended, (2) willing so as to act for that good, and (3) the benefit or enhancement for oneself acquired from that good. In the divine act of willing, however, there is no external good that the Necessary Existent wills for its own sake. There is no separate act of willing the good that is distinct from knowing that good. Finally, there is no benefit that the Necessary Existent acquires as a result of its emanating the existence of the cosmos. The created order alone is the sole recipient of any acquired good. Creating the cosmos thus in no way makes the Necessary Existent better. Its creative act is for Avicenna a purely (indeed the only truly) altruistic act.

As for the order of the good as it manifests itself here on Earth, whether through divine providence or how we interact with others, or even our individual ultimate good or end, these are all issues for the next chapter.