

LEVI BEN GERSHOM (GERSONIDES)

**THE WARS OF THE LORD
BOOK FIVE THE HEAVENLY BODIES AND THEIR MOVERS; THE
RELATIONSHIPS AMONGST THESE MOVERS, AND THE RELATIONSHIP
BETWEEN THEM AND GOD.
BOOK SIX CREATION OF THE UNIVERSE.**

VOLUME THREE

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INTRODUCTION TO VOLUME THREE

THIS third volume of *The Wars of the Lord* completes this translation of Gersonides' *Milhamot Hashem*. It comprises the two longest books of the treatise: Books 5 and 6, each of which is multi-partite. Virtually all the extant manuscripts omit Book 5, part 1 which is a long treatise in mathematical astronomy and trigonometry. Book 5, parts 2 and 3 are philosophical, although they contain much scientific material. In Book 5 the focus is clearly celestial: even when Gersonides discusses earthly matters, such as biological reproduction, he is primarily concerned with the influences of the heavenly domain upon terrestrial phenomena. Indeed, in Book 5, part 3 he investigates the domain of the separate intelligences, those incorporeal substances, some of which are called "angels" in the popular religious literature. The two most important of these substances are the Agent Intellect, which played such an important role for Gersonides in Books 1 and 2, and God. Most of Book 5, part 3 is devoted to an analysis of the functions and attributes of these two incorporeal substances. It is in chapter 12 of part 3 that one finds Gersonides' most systematic discussion of the nature of God.

Book 6, comprising two parts, is chiefly concerned with one of the most controversial questions in medieval philosophy: creation of the universe. In part 1 Gersonides canvasses and criticizes the many arguments for the various cosmological positions presented in the ancient and medieval literature. More importantly, he develops his own theory of creation, which departs significantly from those of most of his predecessors in the Jewish philosophical literature. Contrary to Saadia Gaon and Maimonides, who defend the traditional theory of creation *ex nihilo*, and in opposition to Aristotle and the Muslim Falasifa (e.g., Averroes), who advocate the eternity of the universe, Gersonides holds a modified version of Plato's theory of creation out of formless matter. He believes that both the creation *ex nihilo* and the eternity of universe doctrines are absurd. In addition, he maintains that the universe is indestructible, albeit created. Finally, he defends the relatively conservative Aristotelian thesis of the unicity of the universe. In the course of his many arguments Gersonides also makes some very interesting comments about the nature of time and of the infinite.

-3-

Book 6, part 2 really contains two separate sub-treatises. The first eight chapters are more continuous with part 1, since they too concern creation. But unlike the material in part 1 these chapters are exegetical: here Gersonides wants to show that Genesis 1 is compatible with the philosophical theory of part 1. These chapters complement his own *Commentary on the Torah*, which was written after *The Wars of the Lord*. Chapters 9-14, however, focus upon a different issue: the role of miracles in prophecy, especially the testing of prophets. The justification for including this topic in the book on creation lies in the fact that miracles are possible if creation is proved to be true.

The general scope of Gersonides' treatise can be summarily presented: whereas Book 1 focused entirely upon man, in particular the intellect and its immortality, and Books 2-4 concerned God's communication with, knowledge of, and care for man, Books 5 and 6 concentrate upon God's relationship with the entire universe. As the treatise unfolds, its scope becomes more universal. Although in some important respects Gersonides was an anthropocentrist, unlike Maimonides, his vision was far more comprehensive. Man is just one part of the universe, the entirety of which is God's creation, as man is.

-4-

SYNOPSIS OF BOOK FIVE

I.

BOOK Five of *The Wars of the Lord* is the most heterogeneous and the longest part of the whole treatise. It has as its general descriptive title: "Concerning the heavenly bodies, their movers, their mutual hierarchical relationships, and the hierarchical relationships of God to these movers." In its original format Book Five comprised three distinct parts: part 1 takes up technical, mathematical problems in astronomy; part 2 provides explanations of certain astronomical phenomena, such as how the sun heats the air; part 3 delves into the relationship of God to the movers of the heavenly bodies, the Separate Intelligences. Of the three, part 1 is the longest, and because of both its length and mathematical character it is not included in most of the manuscripts or in the two printed editions of *The Wars of the Lord*. As far as we know, it was included in only one complete manuscript of *The Wars of the Lord*, the Turin manuscript, which unfortunately was destroyed in the fire that ravaged the Turin library in 1904. ¹This part survives only in four separate manuscripts and in four Latin translations thereof. Fortunately for us, Professor Bernard Goldstein has recently published an edition and translation of the first twenty chapters of part 1, and the modern reader at least can flavor some of the contents of this work. ²Parts 2 and 3 are included, however, in most of the manuscripts and in the printed editions. Although both parts contain much astronomical and scientific material, they are for the most part not mathematical and thus are more consistent with the philosophical character of the rest of the treatise. Of these two parts, part 2 is more scientific in content and hence more continuous with part 1.

Yet, all of Book Five is unified by its concern with celestial phenome-

¹Touati, *La Pensée*, p. 54 n. 29. B. Goldstein, "Preliminary Remarks on Levi ben Gerson's Cosmology", in: *Creation and the End of Days*, ed., D. Novak and N. Samuelson, (Lanham, MD. 1986), 261-76.

²B. Goldstein, *The Astronomy of Levi ben Gerson*, (New York, 1985).

na: it moves from the mathematical astronomy of part 1 to the physical astronomy of part 2 and then concludes with the metaphysical cosmology of part 3. In this ordering of the parts of Book Five Gersonides departs both from Aristotle and Ptolemy, his two mentors in science. Aristotle had placed mathematics (including astronomy) between physics and metaphysics: like the former it studies the quantitative properties of bodies; but, unlike physics, it studies them in abstraction from their embodiment in moving things. In this latter respect, mathematics is like metaphysics or theology, since both subjects are "abstract" and deal with unchanging properties or entities. Yet, in spite of its proximity to the science of the divine, mathematics was of no great interest to Aristotle, who wrote no separate treatise on the subject. ³Ptolemy, on the other hand, regarded mathematics as superior to metaphysics because the latter was relatively poor in confirmed conclusions. Indeed, for Ptolemy mathematics is the paradigm for epistemic certainty and success. ⁴Gersonides agreed with Ptolemy's evaluation of the epistemic superiority of mathematics. He makes this quite clear in his *Commentary on Song of Songs*. In this latter work Gersonides explicitly states that mathematics (including astronomy) is to be studied *before* physics and metaphysics because of its logical elegance and epistemic certainty. ⁵But he follows Aristotle in placing metaphysics, or theology, at the apex of the sciences; for it deals with the divine. In his tri-partite division of Book Five, Gersonides acknowledges the ontological priority of metaphysics, and hence it is placed last in Book Five; at the same time he recognizes that the mathematical features of the heavenly bodies are epistemically prior in so far as they are the

data, the factual "givens" that constitute the beginnings of the inquiry and the objects to be explained. Accordingly, mathematical astronomy is placed first in Book Five, even though it will be "transcended" by and incorporated within the rest of Book Five.

Actually, Gersonides' ordering of these sciences expresses more consistently a basic point in Aristotle's methodology. According to Aristotle, there are two important stages in any scientific inquiry: (1) first, the establishment of the facts; (2) then the determination of their causes.⁶

³Aristotle, *Metaphysics*, VI:1. To be sure, there are in Aristotle discussions of mathematical concepts, e.g., the point, the infinite. These have been assembled and commented upon by T. L. Heath in his *Mathematics in Aristotle*, (Oxford, 1949). More recently Aristotle's philosophy of mathematics has been studied by Jonathan Lear in his *Aristotle: The Desire to Understand*, (Cambridge, 1988).

⁴Ptolemy, *The Almagest*, trans. G. J. Toomer (London, 1984), Bk. 1, Preface, 35-36.

⁵Gersonides, *Commentary on Song of Songs*, 13a, 14ab [S. Feldman, "The Wisdom of Solomon: A Gersonidean Interpretation", in: *Gersonide en son temps*, ed., G. Dahan, E. Peeters : (Louvain-Paris, 1991), 61-80].

⁶Aristotle, *Posterior Analysis*, I:2 and 13.

However, in the development of astronomy a division of labor principle had been adopted, whereby the first task was allotted to the astronomer, and the second was given over to the physicist. In late Greek astronomy, the astronomers already had confined themselves to the construction of mathematical, i.e., geometrical, models whose goal was to give an accurate representation of the observed phenomena; or, as it was put, "to save the phenomena." This was the motivation and the justification for Ptolemy's exaltation of mathematics. The development of an adequate *physical theory* that would explain these facts and single out one of several alternative mathematical models as *the true* one was generally ignored by astronomers or given over to the philosopher.⁷

In the Middle Ages, however, dissatisfaction with this bifurcation of intellectual labor had emerged, especially since Ptolemy's geometrical models were not consistent with Aristotelian cosmology. Maimonides, no mean astronomer himself, expressed reservations about this split between astronomy and physics.⁸ To Gersonides this situation was positively appalling. In the opening chapter of part 1, he vividly describes the mutual recriminations leveled by the astronomer and the physicists, each trying to absolve himself of the responsibility of discovering *the true* astronomical theory that uniquely corresponds to reality. Recognizing that most astronomers were neither willing nor able to undertake this responsibility, Gersonides envisaged a new type of scientist who would incorporate within *one* theory both mathematical astronomy and natural philosophy, or physics. Moreover, this "new science" would have to be understood within a metaphysical framework.⁹

This is exactly what Gersonides attempted to accomplish in Book Five of *The Wars of the Lord*. In part 1, the focus is upon the observed facts and their precise mathematical representation. In part 2, Gersonides proceeds to provide physical explanations of some of these facts and posits several general principles whereby many of them can be explained. We have here a "proto-astronomy." But physics is not enough. The heavenly domain is only a part of the universe, albeit its most superior part. All of the physical world is caused, sustained, and guided by incorporeal forces

⁷Ptolemy confines himself to mathematical astronomy in his *Almagest*; in his later *Planetary*

Hypotheses, he attempted a physical explanation of the facts mathematically described in the former work [J. Dreyer, *A History of Astronomy from Thales to Kepler*, (New York, 1953), 157. Maimonides, *Guide*, II:11. G. Freudenthal, "Spiritual Perfection and Astronomy: Gersonides' War against Ptolemy" (Hebrew) *Da'at*, 22 (1989), 55-72].

⁸Maimonides, *Guide*, II:24.

⁹B. Goldstein, *The Astronomy of Levi ben Gerson*, chap. 1.

-7-

and entities, the sum total of which constitutes a domain in itself. Accordingly, the world of moving bodies has to be understood in terms of metaphysics, or theology, the study of these incorporeal powers. This is part 3 of Book Five. Thus, Book Five sequentially reproduces the curriculum of the new science proposed by Gersonides. In this Synopsis, the metaphysical implications of this science will be emphasized, but a few salient features of Gersonides' astronomical ideas will be mentioned first.

II

Virtually all of medieval astronomy is a set of variations on the Aristotelian-Ptolemaic theme of a geocentric universe in which the heavenly bodies describe circular orbits around a stationary earth. Although in the history of Greek astronomy there were some attempts to formulate a heliocentric hypothesis, a motif that was heard in the Middle Ages by a handful of thinkers, ¹⁰ most medieval astronomers worked with the astronomical parameters defined by Aristotle and Ptolemy. Aristotle had adopted the theory of the Greek astronomer Eudoxus, according to whom all the heavenly bodies are fixed in spheres which, in turn, are nested concentrically within each other. This model had difficulty in accounting for the observed variation in the distances of the planets from the earth and their apparent irregular, or retrograde, movements. Accordingly, Ptolemy set himself the task of providing a more satisfactory account of the planetary orbits. His own theory makes heavy use of ideas foreign to Aristotle's model: epicycles and eccentrics. These are geometrical models that attempt to satisfy the basic Greek postulate that the observed celestial movements should describe uniform and circular orbits. An epicyclic model shows how a planet, say Jupiter, describes a circle around a point, the center of the sun, which body in turn describes a larger circle around another point, the center of the earth. Or, by means of the eccentric model, the orbit of the sun is explained as describing a circle, not around the earth itself, but around another point. In this way, Ptolemy believed he could regularize mathematically the planetary motions without ignoring how they in fact appear. ¹¹

There were medieval thinkers, however, who were disturbed by the Ptolemaic deviations from Aristotle's homocentric universe, and several astronomers tried to simplify the system by eliminating either epicycles

¹⁰Gersonides refers obliquely to such an astronomer in chapter 51 of part 1. Nicholas Oresme, a younger contemporary of Gersonides in France (d. 1382), also speculated about a heliocentric universe, but dropped the idea. N. Oresme, *Le Livre du ciel et du monde*, ed. and trans. A. Menut and A. Denomy (Madison, WI., 1968), 521-39.

¹¹L.E. Dreyer, *A History of Astronomy From Thales to Kepler*, (New York, 1953) 2nd edition, chaps. 7 and 9.

-8-

or eccentrics. ¹²Others, like al-Bitruji, rejected these "ad hoc" mathematical models altogether and tried to preserve the Aristotelian-Eudoxan homo-concentric sphere theory. ¹³Although Gersonides remained within the Ptolemaic geocentric framework, he departed from Ptolemy in several important respects. In particular, he rejected epicyclic models in favor of eccentrics. For example, in his model for the moon, Gersonides did not follow Ptolemy in using epicyclic motions, since such a device implies that we would observe one side of the moon at one time and the other side at another time. This is, of course, false; we see only *one* side of the moon. Thus, his reason for this rejection of Ptolemy was not fidelity to Aristotle but respect for the observed facts. Unusual for his own day was Gersonides' habit to make his own observations rather than to rely upon those compiled by Ptolemy, which were continued to be used by medieval astronomers. Throughout his astronomical work, Gersonides always gave priority to observation as against traditional astronomical theory. ¹⁴

This observational orientation is also seen in his concern for astronomical instrumentation. In part 1 of Book Five, he discusses an instrument that he himself invented, to which he gave the names "The Staff" (*Ha-maqel*) and "The Revealer of Profundities" (*Megaleh 'Amuqot*). In a rare moment of poetic imagination, he wrote two short poems about this device, from which I now include a few verses:

First Poem

"...For man every instrument is prepared to afford him understanding
To know all the obscurity in the secrets of creation and its Maker...
The work of the heavens, [their] orbital paths
A man can ask his staff for advice and it will tell him."

Second Poem

"...He who has looked at the stars above through me [i.e., the Staff]

¹²Maimonides refers to the attempt to eliminate epicycles by the Muslim philosopher-astronomer ibn Bajja (*Guide*, II:24).

¹³For Al-Bitruji see B. Goldstein, *Al-Bitruji: On the Principles of Astronomy*, (New Haven, 1971). Gersonides considers al-Bitruji's hypothesis, referring to him indirectly as "the master of the new astronomy", but rejects it (B. Goldstein, "Preliminary Remarks on Levi Ben Gerson's Contributions to Astronomy", *The Israel Academy of Sciences and Humanities Proceedings*, vol. III No. 9 (1969), 239-54).

¹⁴B. Goldstein, *The Astronomy of Levi ben Gerson*, chaps. 3 and 20. idem., "Theory and Observation in Medieval Astronomy", *Isis*, LXIII (1972), 45-47

has opened up the gates of heaven.

He knows the structure of their spheres and the orbits of the sun and the moon...". ¹⁵

This instrument was invented for the purpose of measuring the angular distance between the stars. Gersonides also made extensive use of the *camera obscura*, an astronomical device invented earlier, for the measurement of the apparent sizes of the heavenly bodies, a topic in which, unlike most medieval astronomers, he was quite interested. ¹⁶Gersonides' astronomical empiricism is best expressed in the following passage: "There is no force in arguments of these kinds to refute what is clearly evident to the senses; for true opinions follow from [or are in

accordance with] reality, and it is not necessary that reality follow [our] opinions." ¹⁷ It is perhaps not without interest to note that one of the greatest astronomers, Johan. 13es Kepler, thought highly of Gersonides, whom he heard of or knew from Latin sources, and tried to obtain a complete version of part 1 of Book Five. ¹⁸

III.

But, as we have mentioned, Gersonides was more than a descriptive astronomer. He was also concerned with providing an account of *why* the heavenly bodies behave in the way in which they do in fact behave. In part 2 of Book Five, Gersonides considers several specific astronomical phenomena, e.g., the heating of air by the sun, and gives their physical causes. Although no general astrophysical theory is explicitly worked out, Gersonides does lay down certain general principles from which a partial theory could be extrapolated. ¹⁹ Moreover, these principles are invoked to explain a number of technical problems in mathematical astronomy, such as the positions of the planets at certain times. Finally, in his discussion of these phenomena he makes us aware of certain ideas that are indicative of the direction or tone of his latent astrophysics and that are of considerable importance in the more philosophical portions of

¹⁵The Hebrew texts are included and translated in full by Goldstein in *The Astronomy of Levi ben Gerson*, chap. 9. The verses I have cited are in my own translation. See also E. Renan and A. Neubauer, *Les écrivains juifs français*, (Paris, 1893), 274 (620).

¹⁶A.C. Crombie, *Medieval and Early Modern Science*, (New York, 1959) vol. 1, 113. B. Goldstein, *Preliminary Remarks*.....244-46.

¹⁷The Hebrew passage is cited in Goldstein, op. cit., p.247; the translation is mine.

¹⁸Andre Neher, *Jewish Thought and the Scientific Revolution of the Sixteenth Century*, (Oxford, 1986) 192-93.

¹⁹See Bk. 5, pt. 2, chap. 8.

part 3 of Book Five and part 1 of Book Six.

It will be useful to situate these ideas within the context of an ongoing debate in cosmological thought. Aristotle himself places his own physics in opposition to the Democritian atomist theory, whose mechanistic aspects were particularly repugnant to Aristotle. Whereas for Democritus nature exhibits an iron-clad, non-teleological regularity, for Aristotle the natural order is goal-directed. To be sure, there are "accidents," or chance phenomena, but they are to be understood within a teleological framework. It is only because it is "normal" for caterpillars to become butterflies that we can say it was an "accident" or "by chance" that the caterpillar didn't become a butterfly when it was eaten by a bird. On the other hand, the bird's eating the caterpillar was "normal" too. After all, it has to eat if it is to survive. So, although the natural sequence inherent in the caterpillar-butterfly story can be interrupted by aviary eating habits, regularity and goals are still preserved. Not so with Epicurus' natural philosophy, however, wherein the atoms of Democritus are retained but not their fixed and determinate movements. To break the hold of Democritian necessity, Epicurus introduced the "swerve," an irregular deviation in atomic motion, giving rise to randomness in nature, even in the heavenly domain, where Aristotle explicitly states no chance or accidents are to be found. ²⁰

Gersonides' cosmology was teleological: for him, as for Aristotle, there are inherent natural goals and ends that govern the behavior of natural phenomena and processes. Indeed, as we shall see, this teleological orientation will be of capital importance in his discussion of creation of the

universe. In Book Five, especially part 2, Gersonides uses this teleological conception of nature to explain the behavior and character of certain astronomical phenomena. Actually, his teleology may be even more extreme than that found in Aristotle, for Gersonides' universe is not only teleological but anthropocentric: he sees man and human needs as the goal implicit in the behavior of many astronomical phenomena. This teleological-anthropocentric orientation has the general consequence that in his astrophysical explanations Gersonides frequently, but not always, will appeal to such considerations. Although today one would argue that it is possible to explain the behavior of a heavenly body in purely mechanistic terms -- the method favored by modern scientists and astronomers ever since Descartes -- Gersonides would say that the behavior of a par-

²⁰Aristotle, *Physics*, II:8-9. Lucretius, *On the Nature of Things*, Bk. II. Cicero, *On the Nature of Gods*, I:20. For an excellent modern treatment of Aristotle's teleology see Martha C. Nussbaum's *Aristotle's De Motu Animalium*, (Princeton, 1978). Giovan.15i Reale, *A History of Ancient Philosophy*, III: *The Systems of the Hellenistic Age*, trans. J. Catan (Albany, 1985), pt. 2, chap. 1.

ticular planet or celestial body is the way it is because this behavior benefits man. This latter kind of explanation is especially useful, Gersonides claims, when no adequate mechanistic, or non-teleological, account of the phenomenon is available, as is the case he argues for many such phenomena.

In opting for this extreme teleological perspective, Gersonides departed from Maimonides' more moderate teleology. Maimonides opposed anthropocentric thinking because of his insistence upon the perfection and superiority of the heavenly domain, especially vis-a-vis man. Aristotle had taught that the heavenly bodies have a different and more perfect chemical constitution from that found in earthly bodies and that the motions of the former are circular, continuous and unchanging, whereas those of the latter are rectilinear, non-continuous and variable. How then can we say that the heavenly bodies exist for the earthly domain? This would be tantamount to saying that the superior exists for the inferior! To be sure, the heavenly bodies do influence things here on Earth, but such influence merely follows causally from their intrinsic nature. For example, the sun and the moon obviously have effects upon the Earth. But instead of saying that these bodies exist for the sake of man's need for illumination, we should say merely that these bodies are such that they either emit or reflect light, which, given the distance of the Earth from these bodies, is received on Earth. Thus, for Maimonides, the creation of the luminaries on the Fourth Day does not signify that these bodies were created for man; rather, this passage merely tells us that these bodies naturally give or reflect light. ²¹

Gersonides flatly rejects this interpretation of the Creation and of natural teleology. When it is said -- "And God saw that it was good" -- this means, Gersonides claims, that all which God has created not only has a purpose, but that this purpose is in some way oriented towards the satisfaction of a human need. After all, the heavenly bodies are perfect, as has been admitted by all. This means that their movements do not realize or satisfy any need or lack that they themselves have. The emission of light by the sun, for example, does not do anything for the sun. Its emission of light must have some goal; otherwise, it would be fortuitous, and Aristotle has precluded this possibility with his saying, "Neither nature nor God does anything in vain." ²² Nor does it follow from the fact that the sun emits light for the purpose of providing illumination for the Earth that the superior substance, i.e., the sun, exists for the inferior substance, i.e., man. It is possible, Gersonides argues, that there be something in or

²¹Maimonides, *Guide*, II:11 and III:13.

²²Aristotle, *On the Heavens*, I:4, 271a35.

a feature of the sun that exists for that which is inferior to the sun without the sun itself existing for man. In other words, whereas the sun as such is not made for man, its light is. Similarly, the moon itself was not made for man, but its gravitational power over the tides is a feature that was given to it for the benefit of man. In this way, Gersonides is able to defend his teleological-anthropocentric conception of nature against the charge of Maimonides that on this view the superior entity (e.g., the sun) exists for an inferior entity (e.g., man), for, Gersonides replies, the former entity itself was not created for the latter; rather, only a particular feature of it was given to it for the purpose of benefiting inferior substances. ²³In this respect, it justifiably could be said that Gersonides is more traditional than Maimonides, for anthropocentrism is clearly indicated in the Biblical account of creation, wherein man is created at the end of the creative process, suggesting that he is the apex and goal of creation. This view is also echoed in the *Mishnah*, where Rabbi Akiba says: "Beloved is man because he is created in the image of God; he is especially beloved because he was informed that he was created in the image of God, as it is said, 'In the image of God He made man.'" ²⁴

Nevertheless, it should not be concluded that Gersonides' astrophysics is always so teleological, indeed anthropocentric. There are astronomical phenomena that he discusses in a non-teleological manner; for example, the Milky Way. Since the ancient Greeks, this celestial phenomenon had been a subject of scientific speculation. According to Aristotle, the Milky Way is *not* a celestial phenomenon but belongs to the terrestrial domain or, more precisely, to the region that Aristotle calls "meteorological," i.e., the uppermost region of the earth's atmosphere where air and fire are mixed together and form hot and dry vapors. The Milky Way is for Aristotle a phenomenon, like comets, consisting of a mixture of fire and air produced by the motions of the sphere of the fixed stars, particularly that part of this sphere where the stars are most numerous and concentrated. ²⁵Although almost always loyal to Aristotle, Averroes rejected this explanation and proposed three alternative hypotheses, of which two locate the Milky Way in the sphere of the fixed stars. ²⁶Gersonides provides a detailed critique of both Aristotle's and Averroes' views and ultimately opts for a revised formulation of Averroes' second hypothesis. According to Gersonides, the Milky Way is a part of the sphere of the fixed stars that receives light from the sun, not

²³Gersonides, *The Wars*, Bk. 5, pt. 2, chap. 3.

²⁴*Mishnah*, *Avot III*:14.

²⁵Aristotle, *Meteorologica*, I:8.

²⁶Gersonides, *The Wars*, Bk.5, pt.2, chap. 9 (end). Averroes, *Middle Commentary on Aristotle's Meteorologica*, (Latin), 412K-M.

from the other stars, as Averroes had suggested. ²⁷

IV

The most diverse part of the entire *Wars of the Lord* is part 3 of Book Five. It considers such questions as reproduction and embryology, the movers and the movements of the heavenly bodies, their interrelationships, God and His attributes, His relationship to the movers of the heavenly bodies, and the role of the Agent Intellect and its relationship to the other movers of the heavenly bodies and to God. From the bottom to the top! What keeps all these different themes together is the basic hierarchical conception of the universe that was characteristic of the

medieval mind: All existence was seen as a unity having a definite tier-structured order, in which each level of being is a step toward a higher level, which in turn includes all the perfection of each lower level. The universe was regarded as a ladder whose rungs were different kinds of beings, hierarchically arranged such that each rung was considered a more perfect kind of being than its immediate lower one. Of course, the highest rung was God. In a sense, such a view was anticipated by the Bible with its conception of God, the angels, the heavenly bodies, man and the lower animate creatures. When the Aristotelian cosmology was grafted onto this biblical scheme, the angels were identified with Aristotle's unmoved movers, or Separate Intelligences, of the heavenly spheres. ²⁸This biblicalAristotelian schema generated, however, several problems that were to vex the medieval philosophers. Some of these difficulties were variations of the Greek question, "how do we get a plurality from a unity?" In the Middle Ages, this question fissionated: (1) How do we get a plurality of entities from the one God? (2) How do the Separate Intelligences, Angels, derive from God? (3) How are the Separate Intelligences mutually diversified and related? (4) Is God Himself a mover of a heavenly sphere? It is to these questions, as well as to some others, that part 3 of Book Five is devoted.

Actually, Gersonides does not begin part 3 with these heavenly and heady matters. He considers first the more mundane issue of biological reproduction, how animate substances are generated. One understand-

²⁷Gersonides, *op. cit.* It turned out that Averroes' third hypothesis, anticipated by the pre-Socratic Greek philosopher Democritus, is the correct view. The Milky Way is itself a collection of small stars densely packed together. This view was confirmed by Galileo with his telescope [Galileo, *The Starry Messenger*, (New York, 1957), 49. J.L. Dreyer, *A History of Astronomy...*, 29 and 121].

²⁸Maimonides, *Guide*, 11:4-7.

ably might ask right at the outset, "Why is this relevant to any of the preceding topics of Book Five and to the questions just raised in the previous paragraph?" Remember, however, that in the medieval scale of reality, everything is somehow connected with everything. There is a pervasive principle of unity underlying all diversity and plurality; indeed, this principle of unity may very well be the primary theme of part 3. Whatever this principle may turn out to be, it will be manifested and operative in all phases and levels of being, from the lowest to the highest. Hence, to begin with a discussion of animal generation is by no means an irrelevant concern. Such a discussion may reveal to us some important information about how nature in general is ordered and what the dominant forces in nature are.

Indeed, a consideration of reproduction may very well provide us with a proof of the existence of incorporeal beings, the Separate Intelligences. In Aristotle, the primary proof for the existence of such entities was taken from an examination of mechanics -- in particular, the phenomenon of celestial motion. This inquiry yielded the famous argument for the Unmoved Mover. ²⁹This "proof" became one of the philosophicaltheological staples in medieval philosophy, although we shall see that in later medieval thought this argument was rejected. But, Gersonides claims, we can find traces of divine activity right here on earth. There is no reason why only the "heavens declare the handiwork of the Lord." An examination of animal reproduction will yield, he believes, even a more convincing proof for the existence of supranatural agents and forces. Once the existence of such powers has been demonstrated, we can then discuss their natures and mutual relationships.

Throughout the detailed and difficult discussions of the first four chapters of Part III, there is one chief question to which Gersonides addresses himself: who is ultimately responsible for

reproduction? Is the generation of a living animal to be understood solely in biological, naturalistic terms, as a matter of the coincidental union of a seed and an egg? To feel the force of this question, we must keep in mind the Aristotelian-Ib /> medieval belief that a living being manifests an organized system of capacities and activities, or a soul.³⁰ The soul of a lion is different from the soul of a rose, as does the soul of a man differ from that of the lion; nevertheless, each animate being has a soul, i.e., a set of definite dispositions to act and react. The previously posed question about how an animal is generated turns out to be primarily concerned with the question of the origin of the soul in the animal.

²⁹Aristotle, *Physics*, VII:1; *Metaphysics*, XII:7.

³⁰Aristotle, *On the Soul*, II:1-4.

-15-

The *locus classicus* for this question is Aristotle's *On Generation of Animals*. In an obscure passage in chapter III of Book Two, Aristotle suggests that in the case of rational animals, i.e., men, the soul derives from some external cause, a divine mind that is in some way responsible for the endowment of rational capacities in the human organism.³¹ This passage served as the cue for many medieval discussions on the theories of biological development. Throughout these discussions, the primary question was whether an adequate general embryological theory can be developed without recourse to some supranatural agency or influence. In this debate, some of our earlier philosophical protagonists -- Themistius, Avicenna, and Averroes -- reappear, and as before it is with Averroes that Gersonides primarily tangles.

According to Gersonides, one can find several different answers to this question in Averroes' writings. The answer that Gersonides concentrates upon is Averroes' *denial* of any supranatural intervention or agency in the reproduction of animals other than man. To Averroes, the endowment of soul in the organism is a natural process, requiring no special supranatural intervention. In this view, the soul is generated in the seed by some kind of organic generative power that itself is generated in the seed by the parent of the animal, along with the influence of some of the heavenly bodies, e.g., the sun. This generative power is not, for Averroes, a separate intellect; it is a purely biological, or natural, power. The one exception to this general account is man; in his case, some incorporeal, supranatural power does enter the picture in order to account for his rational soul, as Aristotle had already suggested, but in other living creatures no such agent is needed.³² Now, since animal generation does not in general exhibit any special supranatural activity, it cannot constitute a proof of the existence of such supranatural powers or agents. For Averroes, the chief argument for the existence of incorporeal, supranatural agents is still Aristotle's proof from motion.

Not so Gersonides. He believes that a purely naturalistic explanation of biological development is inadequate; in particular, it fails to account for the generation of the soul in organic creatures. Gersonides makes the general claim that *all* animate creatures, not just man, receive their various capacities and powers, i.e., their souls, from a supranatural agent,

³¹Aristotle, *On Generation of Animals*, 11:3, 736b 28-29.

³²This is the view found in Averroes' commentary upon Aristotle's *Metaphysics* or his third position as summarized by Gersonides in Bk. 5, pt. 3, chap. 1 [Herbert Davidson, "Averroes on the Active Intellect as a Cause of Existence", *Viator*, 18 (1987), 191-225; idem., *Al-farabi, Avicenna and Averroes on Intellect*, (Oxford University Press: Oxford-New York, 1992), chap. 6. C. Touati, *Les Problèmes de la Génération et le Rôle de l'Intellect Agent Chez*

which is itself a soul or intellect -- like comes from like. Neither the seed nor the transmitter of the seed, the parent, can generate, by itself or even together, a soul, for both are corporeal entities that do not have the capacity to generate faculties that transcend in their complexity and teleological structure the purely chemical features of the seed or the parent. And this is true even for plants and animals other than man, for in all animate creatures, there is displayed extraordinary order, economy and purposiveness, which cannot be fully accounted for by a theory that excludes the agency of an intellect. To be sure, the solely material elements in generation -- the semen, the egg, the nutrients, *et alia* -- cannot be ignored, and Gersonides gives them their due. By themselves they do not have the power to produce a set of goal-directed activities that is unified and efficient. There has to be, Gersonides argues, some intellectual supervenient guiding agent that infuses into the seed, egg, nutrients, *et alia* the capacities that constitute what Aristotle called "the soul." Aristotle appreciated the force of this argument when he was treating of the generation of man. But, Gersonides claims, the same is true for all animate creatures: the agent that is responsible for the intellectual capacities exhibited in man is also responsible for the powers and dispositions displayed by plants and other animals, for all animate creatures constitute, as we have already indicated, a unified scale of being characterized by purpose and order. Accordingly, for Gersonides, organic life here on Earth, not the motions of the spheres, is our best proof for the existence of a supranatural agent. ³³

Before we go on to discuss the identity of this agent, it might be useful to relocate this medieval discussion in a more modern context that, perhaps, will be helpful in appreciating Gersonides' point. In his debate with Averroes, we find an anticipation of the controversies in early modern philosophy between the materialists, such as Hobbes and Holbach, and the believers in natural teleology, such as Leibniz, Berkeley, and Newton. The latter philosophers claimed that the purely mechanistic explanation of nature in terms of quantitative notions such as mass, space, time, and motion advocated by the modern "Averroists", the materialists, does not account for all of the facts, especially organic phenomena. The economy and purposiveness exhibited in nature must be explained by a supranatural agent. This conflict was classically formulated by David Hume in his famous *Dialogues on Natural Religion*, in which the protagonist for natural religion, Cleanthes, presents arguments that are quite similar to those we have just found in Gersonides and that are variations of the general kind of argument known as the Teleological Argument for God's existence. Although Hume himself was quite critical

³³Gersonides, *The Wars of the Lord*, Bk. 5, pt. 3, chap. 3.

of this type of argument, Kant had a more sympathetic attitude towards it. Had Gersonides been around, he would have sided with Newton against Holbach, with Kant against Hume.

Throughout the first four chapters of part 3 hardly any reference is made to God. And it is no oversight or accident. For Gersonides, the agent responsible for the generations of animate creatures, or "be-souled" creatures, is not God but another supranatural, separate intellect, lower in status and nobility, but endowed with the requisite features to be the cause of generation here on Earth. It is our old friend the Agent Intellect who now appears, although in a different context and role. In Books One and Two, the Agent Intellect had an essentially epistemological function, as the source of knowledge in general and as the transmitter of certain kinds of information to

special sorts of people. For Averroes, this epistemological function of the Agent Intellect is its primary role, but for Gersonides, the Agent Intellect has another kind of activity: it is directly responsible for the emergence of the soul in animate creatures -- it is the "agent of generation" that guides and influences all the generative processes that take place on Earth. Thus, biological processes are direct proof for the existence of a supranatural agent, which is in this context the Agent Intellect. Indirectly, however, this very same argument serves as proof for the existence of God, who is ultimately the Agent responsible for all natural processes. We shall discover later that the Agent Intellect ultimately derives from God and that the plan and order exhibited in nature -- which is rooted in the Agent Intellect, as the plan of a house is found in some sense in the mind of the architect -- is ultimately grounded in and traceable to God himself, who is the First Intellect. ³⁴

Not only does Gersonides stress the Teleological Argument for the existence of some supranatural power responsible for the order and purposiveness displayed in nature, he actually *denies* the validity of the traditional Aristotelian proof for God drawn from motion, particularly the argument for the unmoved movers of the heavenly spheres. From Aristotle through Aquinas, it was firmly believed that motion was, as Aquinas put it, the most "evident" proof for God. Of all his proofs for God's existence, Maimonides develops this argument with the most detail. ³⁵ Yet Gersonides rejected this argument. Nor was he alone. In the fourteenth century, there were several other philosophers who had doubts about the validity of this argument. John Duns Scotus and William of Ockham, for example, had rejected it. ³⁶ Doubts were raised concerning either the truth of the fundamental axiom of Aristotelian

³⁴Ibid., chaps. 5 and 13. This is originally a neo-Platonic motif. See Plotinus, *Enneads*, VI, 7,2.

³⁵Aquinas, *Summa Theologiae*, I, q.2, a.3. Maimonides, *Guide*, II, chap. 1.

³⁶Duns Scotus, *Philosophical Writings*, trans. A. Walter (London, 1962), pt. 2; Herman Shapiro, *Motion, Time and Place According to William Ockham*, (St. Bonaventure, NY, 1957).

mechanics everything moved has a mover other than itself -- or its universal application to every movable entity. In the case of Ockham, these doubts ultimately led to a different theory of motion, which was to be important in the gradual evolution of mechanics away from Aristotle's principles. Similar reservations were entertained by Gersonides. He, too, was moving away from the sway of Aristotle's mechanics, although not so explicitly or radically as was Ockham, and this tendency is evinced in his rejection of the argument from motion.

Perhaps the most novel feature of his criticism of the argument from motion concerns the concept of continuous motion. For Aristotle, motion is in some sense unnatural, even for the heavenly bodies, which are continually in motion. Rest is really the natural state of all things. This is the Aristotelian notion of inertia. Thus, for Aristotle, if a body is moving, there must be an external cause of both the origin of its motion and its continuance in motion. This point is the core of the argument in Aristotle's proof for unmoved movers in *Physics*, Books Seven and Eight. ³⁷ Now if we assume that the heavenly bodies move eternally and continuously, as Aristotle believes, there must be something outside these bodies that keeps these bodies moving. That which keeps them moving must itself be unmovable; otherwise, an infinite and vicious regress would ensue. Accordingly, there must be some incorporeal and immovable entity or entities that are responsible for the continuous motion of the heavenly bodies. These are the unmoved movers, or Separate Intellects, the first of which is God. ³⁸

Gersonides rejects this argument; he does not believe that in every case a moving body needs to be kept in motion by an external force. Under certain conditions, a moving body can continue to

move indefinitely by its own power. For example, if a stone is dropped from a high tower or cliff, it will continue to fall by its own force until it reaches the earth. At no point in its fall is its moving power decreasing such that it has to be kept in motion by another power. If the earth were not there to stop its motion, it would continue to fall *ad infinitum* with *increasing* velocity and momentum. In the case of the heavenly bodies, this means that their continuous motion does not by itself warrant an inference to the existence of external unmoved intellects.³⁹

It has been suggested by Charles Touati that in this criticism of Aristotle Gersonides has anticipated, in part, the Cartesian-Newtonian

³⁷Aristotle, *Physics*, VII:1; VIII:5-6.

³⁸*Metaphysics*, XII:6-7.

³⁹Gersonides, *The Wars*, Bk.5, pt. 3, chap. 6.

-19-

motion of inertia.⁴⁰ Unlike the Aristotelian motion of inertia, which defines inertia as resistance to motion, the modern idea of inertia asserts that body "continues in its state of rest or of uniform motion in a straight line unless it is compelled to change that state by forces impressed upon it."⁴¹ Now Gersonides, unlike his great successor and opponent Hasdai Crescas, did not intend a complete demolition of Aristotelian physics, although here and there he did pick away at that imposing edifice. In this particular context, his purpose was quite modest: he did not believe that Aristotle had proved his case for the existence of unmoved movers, and he wanted to show the defect of Aristotle's argument. What emerges from his criticism of this argument is *part* of the modern inertial principle. However, unlike Newton, Gersonides still believed that circular motion was the best and most natural type of motion and that motion itself represented a phenomenon that had to be explained, since rest was the natural state of a body. In these respects, he remained a good Aristotelian, but he did see the fallacy in one of Aristotle's arguments for the existence of separate, immovable movers. In exposing this fallacy, he came close to the modern idea that a moving body as such doesn't need to be kept in motion, that it continues to move by its own power.

Indeed, Gersonides does believe in unmoved movers, or separate intellects, many of which are the movers of the spheres, but his argument is teleological rather than mechanistic. The order, economy, and purposiveness revealed in nature, and in particular within the heavenly domain, cannot be accounted for by mechanical causes alone. There must be some intellectual principles or agents governing natural processes throughout the whole universe. The earlier argument for such agents in the realm of biological generation is now applied to nature in general.⁴² However, not all these separate intellects or unmoved movers are on the same level. We have already seen that one in particular -- the Agent Intellect -- has several special functions in knowledge and organic generation. Others are assigned to specific planets and other heavenly bodies, but one intellect in particular is unique and supreme -- God. Although the Agent Intellect is the direct, or proximate, agent of organic reproduction, and the unmoved movers are responsible for the motions of the heavenly spheres, all of them are parts of or actors in a wider drama, whose major persona is God. Thus, the order and purposiveness found in the world testifies to an ultimate cause, greater than the Agent Intellect,

⁴⁰C. Touati, *La Pensée*, 311-14.

⁴¹I. Newton, *Mathematical Principles of Natural Philosophy*, trans. A. Motte, revised by F. Cajori (Berkeley, 1934), 13.

⁴²Gersonides, *The Wars of the Lord*, Bk. 5, pt. 3, chap. 6.

whose activity is restricted to the earthly domain. The regularity inherent in earthly phenomena is just a part of a more comprehensive plan governing the universe. Just as Gersonides draws an analogy between the order inherent in the terrestrial domain and its original plan in the Agent Intellect with the structure of a house and the blueprint in the mind of the architect, so, too, this analogy holds with respect to the order of the whole universe and the mind of God. God is or embodies the whole plan and order of the universe. He is the ultimate ground of all rationality, purpose, and uniformity in the universe. ⁴³

This latter point now leads us into a discussion of divine attributes, a topic that was initially raised by Gersonides in chapter III of Book Three in connection with the attribute of knowledge. There we learned that Gersonides rejected the negative theology of Maimonides and advocated a doctrine of religious language that would enable us to make affirmative attributions of God, so long as we realize that these properties do not have exactly the same meaning when they are applied to God as they have when they are predicated of creatures. In part 3 of Book Five, Gersonides returns to this theme but with a more general, positive concern: he wants to set forth the specific attributes of God and give reasons why these attributes are especially appropriate. In his list of attributes, Gersonides includes most of the traditional theological properties, such as being, unity, goodness, knowledge, omnipotence, eternity, etc. Of these attributes, he focuses upon those that derive from the teleological features of the world. The unity, order, beneficence, and wisdom exhibited in nature are all evidence that the corresponding properties are attributes of God. For, Gersonides argues, it is more fitting to ascribe a property to the cause of that property in its effects than to the effects themselves, provided, of course, that the property in question is a perfection, i.e., a feature that it is better to possess than not to possess. Accordingly, it is especially appropriate that we assign to God such attributes as wisdom, goodness, unity, etc. For He is the ultimate source of such features as they are found in the universe.

One particular attribute, however, is denied of Him, an attribute that was regarded amongst some medieval philosophers as especially fitting for God. Averroes, for example, had maintained that God is the mover of the sphere of the fixed stars; Avicenna and Maimonides rejected this view. ⁴⁴ Gersonides sided with the latter thinkers and devotes a separate chapter in part 3 to a criticism of Averroes' position. In short, this criticism is based upon the previous point about God being the plan of the

⁴³Ibid., Bk. 5, pt. 3, chaps. 5 and 6. [S. Feldman, "Platonic Themes in Gersonides' Doctrine of the Agent Intellect", in: *Neoplatonism and Jewish Thought*, ed., L.E. Goodman, (SUNY Press: Albany, 1992), 255-78].

⁴⁴Maimonides, *Guide*, II:4.

whole universe. If God were the mover of merely one sphere, His influence and providence would be restricted significantly. Averroes' thesis is inconsistent with God's role in the total plan of the universe. ⁴⁵

Perhaps the most difficult topic or set of problems dealt with in part 3 concerns the relationships between the various separate intelligences and their respective relationships to God. Throughout *The Wars of the Lord*, Gersonides has often referred to and discussed several different kinds of

separate intellects: the unmoved movers of the heavenly spheres, the Agent Intellect, and, finally, God. Having described in detail the various functions of the Agent Intellect, Gersonides now sees the need to formulate a general theory of the separate intellects, and he devotes four chapters in part 3 to this purpose. Essentially, there were four specific problems to solve: (1) how are the various separate intelligences individuated and mutually related? (2) how do they derive from God? (3) what is the relationship between the Agent Intellect and the other separate intelligences; and (4) what is the precise relationship between the Agent Intellect and God, the two separate intellects that seem to be alike in certain respects? These topics had occasioned considerable discussion amongst the medievals, and it was now Gersonides' turn to see if he could provide the answers.

Various theories concerning the emanation and individuation of the separate intelligences and their mutual relationships had been proposed. All of them assumed the Aristotelian thesis that matter is the principle of individuation: bodies are differentiated by means of quantitative and qualitative properties, e.g., color.⁴⁶ But how, then, are we to differentiate incorporeal entities such as the Separate Intelligences? The most influential solution was the theory that these incorporeal entities emanate in some manner from God and are differentiated from each other in terms of a complex causal relation. Suppose, for example, that A,B,C...K constitute a set of separate intellects such that A is the cause of B, B is the cause of C, J the cause of K. Accordingly, A is differentiated from C, for example, by being the cause of B, whereas C is the cause of D. Nevertheless, they are all mutually related in so far as they are all derived from God in such a manner that their various roles and properties are coordinated.⁴⁷ Different variations were played on this theme: some philosophers, for example, added the point that each intelligence moved a different sphere, and hence was differentiated in this way; others focused upon the knowledge possessed by one intellect of another intel-

⁴⁵Gersonides, *The Wars of the Lord*, Bk. 5, pt. 3, chap. 11.

⁴⁶Aristotle, *Metaphysics*, VII:10, 1035b 28ff.

⁴⁷Maimonides, *Guide*, II, Introduction, Proposition 3; chap. 4.

lect.⁴⁸ Whatever the variations, there was one common theme: in deriving from God, all the separate intellects, except the first derived intellect, emanate one from the other, forming an incorporeal chain of power and agents. Although Maimonides had reservations about this complicated theory, he still held on to a version of it.

Not so Gersonides. After a long and detailed critique of the theory, he reaches the following conclusions. First, the separate movers of the spheres are all created *simultaneously* by God; they do not emanate from God and from each other, as the prevalent theory claimed. Second, these separate intelligences are not causally related, therefore, to each other. Third, whereas according to some of the previous theories these various intelligences were related to each other by a cognitive relation, which grounded the causal relationships, Gersonides denies that any separate intelligence but God knows any other separate intelligence. Indeed, the movers, or intelligences, of the spheres apprehend only a part of the sublunar world: they apprehend only that sub-domain of the Earth over which they have a special influence. The mover of the moon, for example, has knowledge only of the oceans and tides. Accordingly, it is by means of their different influences and cognitions thereof that the various intelligences are differentiated.⁴⁹

But if each such separate intellect has only partial knowledge of the sub-lunar world, how are these respective influences coordinated so that a unified system of nature results? Using one of his favorite metaphors, Gersonides answers this critical question as follows. Just as various craftsmen on a job are organized into a cooperative and effective team by a supervisor who

plans, coordinates, and oversees their respective activities, so, too, is there one superior intellect that is ultimately responsible for the whole plan of the universe. This latter intellect is God, or the First Intellect. Gersonides uses another metaphor to express this relationship: God is the ruler of a perfect state over which He appoints subordinate ministers, the separate intelligences, each of which has a specific duty to perform. All of these ministers, however, are coordinated and supervised by the ruler of the state, God, so that a unified system is achieved. ⁵⁰

There remains, however, one matter still to be discussed. Towards the end of part 3 of Book Five, Gersonides attempts to sum up and formulate his theory of the Agent Intellect in terms of its relationship to the other

⁴⁸Jehudah Halevi, *The Kuzari*, IV:25.

⁴⁹Gersonides, *The Wars of the Lord*, Bk. 5, pt. 3, chap. 7. In Bk. 6, pt.1 and in his *Commentary on Genesis*, Gersonides will claim that these intelligences were created on the First Day of Creation.

⁵⁰Gersonides, *The Wars of the Lord*, Bk.5, pt. 3, chap. 8; Bk. 6, pt. 1, chap. 18. Whereas the metaphor of the master craftsman is based upon Aristotle (*Metaphysics*, I:1), the perfect ruler analogy is of course Plato's (*Republic*, V).

separate intellects. This task is especially pertinent, since he has departed from the standard medieval theory of the emanation of these intellects from God and from each other. To understand properly Gersonides' account of this matter, it is first necessary to appreciate the unique status and role that the Agent Intellect has. Unlike the movers, or intellects, of the heavenly spheres, the Agent Intellect has a *complete* apprehension of the plan governing and operative in the terrestrial domain. And it is no wonder; for this intellect is particularly concerned, as we have seen, with the affairs of men, as exhibited in its cognitive role, and with the processes of generation in all animate creatures. Thus, the Agent Intellect cannot be restricted merely to a partial conception of what goes on here on Earth. Like God, the Agent Intellect has then a complete apprehension of the order and plan of the terrestrial world; unlike God, the Agent Intellect does not have an apprehension, complete or partial, of the celestial domain. Moreover, the Agent Intellect was not created by God directly along with the other separate intellects, the movers of spheres. Instead, it emanates directly from all the other separate intellects together. It, therefore, can apprehend as a unity *all* their partial influences upon the Earth. The plan exhibited here on Earth -- a plan that is already comprehended in the total scheme of the universe, which is contemplated by the First Intellect, God -- is also found in the Agent Intellect. Again, Gersonides uses the previous metaphor of the architect, or master craftsman: the Agent Intellect is related to the Earth in a similar way as the plan in the builder's mind is related to the plan exhibited in the house. In this respect, the Agent Intellect is unique amongst all the other created separate intellects, all of whose activities are limited and specific.

One may recognize here traces of the Platonic theory of ideas as developed by Philo in his doctrine of the Logos. For Plato, it was unclear where the abstract, transcendent ideas were located. Philo answered this question by locating them in the mind of God, or "His Word." ⁵¹

Gersonides' account of the Agent Intellect is in certain respects similar to that of Philo's theory of the Logos, although the latter is not developed within the Aristotelian theory of the unmoved movers of the heavenly spheres or of the separate intellect needed for cognition. Both the Logos and Agent Intellect are "encasements" of the plan exhibited in the world or in the Earth. It should be noted, however, that neither Philo's

⁵¹For the various dimension of Philo's Logos concept see Wolfson, *Philo*, (Cambridge, MA., 1947) vol. I, chap. IV; and David Winston, *Logos and Mystical Theology in Philo of Alexandria*, (Cincinnati, 1985) chap. I.

-24-

Gersonides' account of the Agent Intellect is in certain respects similar to that of Philo's theory of the Logos, although the latter is not developed within the Aristotelian theory of the unmoved movers of the heavenly spheres or of the separate intellect needed for cognition. Both the Logos and Agent Intellect are "encasements" of the plan exhibited in the world or in the Earth. It should be noted, however, that neither Philo's Logos nor Gersonides' Agent Intellect is an object of worship or veneration. Neither entity is personalized or becomes incarnate, as is the Logos concept in Christianity. For Philo and for Gersonides, the Logos and the Agent Intellect have several specific functions, but none of these functions is in any way redemptive.

Despite the obsolescence of Gersonides' science, we ought to remember that his general cosmological theory was designed to explain the observed order inherent in the universe, that its ultimate aim was to see all of reality as a unified system despite its various differences and levels of existence. The identification of the Aristotelian theory of the separate intelligences with the Biblical-Rabbinic doctrine of angels resulted in a synthesis of two apparently very different cosmologies that was to dominate man's mind for centuries, indeed, at least until the days of Kepler. In this latter respect, Gersonides' cosmology is an excellent example of how Biblical notions were interpreted in the light of philosophical-scientific theories and conversely.

-25-

BOOK FIVE

Part 2 ¹

CHAPTER I

An explanation of why we have embarked on this difficult investigation concerning which other thinkers have written only little.

¹There is no uniform title for Book V. The Vatican manuscript contains the prefatory remark that Gersonides (writing in the editorial "we") has written a large book on astronomy, in which Part 1 of Book V can be found, whereas in the present philosophical treatise only Parts 2 and 3 will be included. The same information is contained in the Paris manuscript #723, although with some variation in phrasing. The Bodleian manuscript, however, contains no title description for Book V at all and simply begins with the Table of Contents for Part 2. Even the two printed editions differ in their title-descriptions for Book V. The 1560 *editio princeps* has the following:



"Book V is divided into three parts. The first part is concerned with astronomy, especially] with what is explained in [Ptolemy's] *Almagest*. But this part is a large book in itself and has no place in this treatise."

The title-description for Book V in the 1866 Leipzig edition adds a preliminary sentence concerning the contents of the whole of Book V:



"Book V: concerning the heavenly bodies and their movers, the status, [or relationships] of their movers to each other, and their status [or relation] vis-a-vis God (may he be blessed). ..."

It also gives a title description for Part 2:

"Concerning the causes of the phenomena found in the heavenly bodies."

CHAPTER II

An investigation into the nature of the body that doesn't preserve its shape that exists, as we have explained, between one heavenly body and the spheres of another body. A resolution of a certain difficulty pertaining to this hypothesis [also] will be given.

CHAPTER III

A proof that the planets and stars ²are in the spheres for [the benefit of] terrestrial phenomena.

CHAPTER IV

A proof that there is no diurnal sphere beyond the zodiacal sphere, as have been thought by some^a investigators.

CHAPTER V

A demonstration that the fixed stars are all in one sphere and why the first sphere [i.e., the sphere of the fixed stars] has many bodies, whereas the lower spheres have [only] one body each.

CHAPTER VI

An explanation of how the sun heats the air and of the special ways in which each of the other heavenly bodies influences [the sub-lunar domain].

CHAPTER VII

A list of questions about astronomical matters that we shall discuss on the basis of the premises available to us.

²*Kokhav*. This term was used in medieval Hebrew astronomy to refer to both stars and planets. This practice was made even more complicated by the use of the term to refer to the planet Mercury (Maimonides, *Treatise in Logic*, Chapter 13.) Throughout Book V, Gersonides uses the term *Kokhav* in the broad sense, covering both the fixed stars and the planets. When he wants to speak specifically about the former, he often uses the expression *Kokhavim gayyamim*; to speak about planets alone, he usually uses the phrase *kokhavei lekhet* (See Bernard Goldstein, *The Astronomy of Levi ben Gershom*, New York 1985).

Since modern English the term "star" is almost always used, especially in scientific discourse, to refer to what the ancients and medievals called "fixed stars," the modern English translator of *Kokhav* cannot uniformly render this term as "star" without misleading the reader. Analogously, it won't do either to translate it consistently as "planet." Thus, I have adopted the expedient of using either the expression "star or planet" or the phrase "heavenly bodies," except where Gersonides specifically distinguishes between planets and stars.

CHAPTER VIII

An exposition of several principles, which are self-evident to the reader of this book, on the basis of which we shall be led to the explanations of these astronomical matters.^b

CHAPTER IX

The explanations of these questions, as far as we have been able^c to discover.

-28-

CHAPTER I

BEFORE we embark upon an examination of the causes [operating] among the heavenly domain, we should justify our undertaking of this very profound topic, concerning which we have not found much in other investigators, for this has only increased our difficulties. Moreover, since these things are very remote from us with respect both to place and substance,¹ it is necessary that our knowledge of them be slight. It would seem then that we should refrain from this inquiry [all together]. Nevertheless, since the attainment of human perfection consists in the investigation of phenomena,^a as far as it is possible for man and in so far as the nature of the phenomenon can be known to man, it is proper that we pursue this inquiry to the extent of our intellectual ability. It is not proper to attribute our investigation into these very profound subjects to our arrogance or rashness; rather we should be praised for our great effort and zeal in investigating these phenomena as best we can. Moreover, if what we shall say concerning this topic turns out to be what can be said of the causes of these phenomena, then we already have achieved the goal of this investigation. But if we have not, then^b we have paved the way for successors. The modicum of the truth that we have attained concerning these phenomena should not prevent us from pursuing this inquiry, for human happiness is reached when knowledge is attained of the most noble things rather than in the knowledge of inferior things. Hence, our desire for knowledge of the more noble is stronger [than our desire for knowledge of the inferior], so that we take more delight in the slight knowledge of the superior things that we possess than in the greater knowledge we possess of the inferior things.

In general, if the heavenly bodies were not effects [of some cause], it would be impossible to undertake this inquiry, as Aristotle says in *On the Heavens*.² Since, however, these bodies are effects, and since it is the nature of effects, in so far as they are caused, that whatever is in them exhibits some purpose, from this aspect the gates of inquiry on this topic

¹The substance, or essence, of the heavenly bodies is radically different from the essences of terrestrial bodies; e.g., the former are simple, whereas the latter are composite (Aristotle, *On the Heavens*, 1:2-4).

²Gersonides seems to be referring to the opening passage of *On the Heavens*, where Aristotle says that the science of nature is concerned with bodies, their properties and principles. The Greek term ἀρχή used by Aristotle here can mean both principle or cause.

-29-

are opened to us. Moreover, since these superior bodies are animate in some sense, and since the actions of animate beings are purposive, the nature of these actions also will be [purposive].³ And in this way we shall be able to inquire with respect to their actions *why* they are as they are. Furthermore, it is evident from the movements of these superior bodies that they provide for terrestrial phenomena. This is quite evident in the movement of the sun; for it has a strong effect [roshem] upon [various kinds of] generation, which is especially apparent in the case of plants.

This is also evident in many animals; e.g., their reproductive cycles correspond to specific time of the [solar] year. In general, the development of sub-lunar phenomena is perfected by the four seasons that derive from the inclined circuit of the sun. ⁴For it is in this way that the equilibrium amongst the contrary qualities, out of which these composite substances are composed, is achieved. In this way, too, the equilibrium amongst the basic elements also is achieved, as has been explained previously. ⁵The influence of the diurnal and lunar revolutions also is evidenced in the things that are generated in the sub-lunar world. Thus, the gestation periods of the animals are measured by the revolutions of the moon in some cases or by the diurnal revolution in other cases, as is mentioned in *The Book of Animals*. ⁶

We should say that the same holds for the revolutions of the stars and planets. This is obvious, as we can see from the observations that confirm [the predictions] of the astrologers. Some of their predictions are empirically verified. Others are truly predicted by them even if [some of] the things they say don't turn out to be correct. The [latter happens] because man is ignorant of the consequences of all the various positions of the individual heavenly bodies. This ignorance is due to the vast distance between man and these bodies both with respect to substance and place and to the impossibility of experimental confirmation. For it is quite possible that what is attributed to the [activity] of one star [or planet] actually emanates from another. [For example,] the masses account for extreme heat by attributing it to the ascendancy of the dog-star, whereas it [really] derives from the sun. It so happens, however, that at that time [i.e., the ascendancy of the dog-star] the sun heats up the air ^c to a considerable degree. In general, it is clearly quite difficult for man to fulfill all the con-

³The view that the celestial bodies are animate and have some kind of intellectual activity is Aristotelian and became a standard doctrine in the medieval Aristotelian tradition (Aristotle, *On the Heavens*, II:12, 292a, 19ff; *Metaphysics XII*:7, 1072a, 25-26; Maimonides, *Guide II*:4-11).

⁴*Galgalo ha-noteh*. Aristotle, *On the Generation and Corruption*, II:10-11. Maimonides, *Guide*, II:10.

⁵Gersonides, *The Wars*, vol. 2, Bk. 4, chaps. 3.

⁶Aristotle, *On The Generation of Animals IV*:10.

ditions for experimental [confirmation] in these things. For it is impossible for us to isolate [the activity of] one heavenly body from another, since they all operate together; accordingly, we cannot determine the special activity of a particular body. Nor is it possible for us to establish by observation the appropriate repetition [of observations] concerning what is necessitated by these heavenly bodies, except with great difficulty and over a considerable length of time. Moreover, since much ^d of what is ordered by them is upset by human choice, as has been explained in Book Two of this treatise, ⁷it turns out that observation does not reveal what should derive from the heavenly bodies; for perhaps what in fact occurs is contrary to what was ordered by the heavenly bodies. This entails that man is quite ignorant of what emanates from the various heavenly bodies with respect to the sub-lunar world. Nevertheless, as has been explained in Book Two of this treatise, ⁸that which does occur in this world is ordered by the heavenly bodies; and in this sense it is possible to have [some] knowledge of what will occur before its actual occurrence by means of dreams, divination, or prophecy, as has been explained in that book. ⁹

It is evident in a general way that the determinate order obtaining amongst generated things in the sub-lunar world derives from the heavenly bodies. Since this order is constant and regular, and from it different things follow others at different times (e.g., at one time generation occurs,

at another corruption, as has been explained in the natural sciences), it follows that the cause of this order must be continuous and that it is operative in different things at different times. Since there is nothing that satisfies this condition but the heavenly spheres ¹⁰-- for because ^e of their motion the heavenly bodies in them are nearer to the earth at one time and farther away at another time, this occurring cyclically -- it is evident that the heavenly spheres are, ^f in this way, the causes of this constant pattern. For it is necessary that this cause be constant, since its effect is con-

¹⁰Although in this passage, and elsewhere, Gersonides uses the expression *ha-geramim ha-sliamayiim*, literally "heavenly bodies", the context requires that it be translated as "heavenly spheres"; for, as he says, the planets or stars are "in them". In Aristotelian astronomy the planet or star is embedded in or attached to a sphere; the sphere moves and the planet or star is moved along with it (Dreyer, *A History of Astronomy from Thales to Kepler*, chaps. 4, 5, 10, and 11).

⁷Gersonides, *The Wars*, vol. 2, Bk. 3, chap. 5.

⁸Gersonides, *The Wars*, Bk. 2, chaps. 1-2.

⁹In the beginning of this paragraph Gersonides claimed that astrological predictions may be well-founded even if they are not always born out by the facts. He then listed several reasons why these predictions may be falsified through no fault of the astrologer. Thus, just because a prediction is not confirmed, it doesn't mean that the prediction was groundless. [Ptolemy, *Tetrabiblos*, trans. F. Robbins (Cambridge, MA., Loeb ed., 1970) Bk. I, chap. 2.)

stant. It is also necessary that the relation ^g between the cause and the effect vary, since its effect receives from it different conditions. And this variation necessarily proceeds in a cyclical manner, since this variation occurs cyclically in the ^h things in the sub-lunar world. Hence, this cause moves circularly in such a way that at one time it is near [the earth] and at another remote from it; and this process is cyclical and continuous, since in this way the [variation] is accomplished. ¹¹However, whether this activity is the primary intention of the heavenly bodies or only a secondary intention ¹²will be discussed later on. In any case, it is evident that from this perspective [i.e., the teleological structure of the universe], it will be possible for us to inquire why the heavenly bodies behave in the way they do.

The fact that the philosophers have agreed that the heavenly bodies exert influence upon the sub-lunar world adds elucidation and confirmation to what we have just shown. Indeed, the Torah and the Prophets (may they rest in peace) also confirm this point. Aristotle says in *On Generation and Corruption* that the regular order obtaining in the generation and destruction of sub-lunar phenomena is consequent upon the motions of the sun along the inclined circle; and that the duration of any existent thing in the sub-lunar world is determined by the circular motion [of the sun], such that the number of rotations by virtue of which the growth of something ⁱ is determined is equal to the number of rotations determining its decay ^j and destruction. ¹³The interpreters of Aristotle maintain that what Aristotle claimed with respect to the movement of the sun is also true of the motions of the other heavenly bodies. This point is to be found in several places in Aristotle's scientific writings, i.e., the heavenly bodies provide for terrestrial phenomena. And Aristotle says in the *Metaphysics* that the movements of the heavenly spheres are for the benefit of the heavenly bodies [in them]. Hence, he inferred from the observable movements of the heavenly bodies the number of heavenly spheres. ¹⁴This shows that Aristotle believed that the movements of the spheres are for the benefit of the sub-lunar world, for if they were [only] for themselves, it would not be the case that their motions are for the heavenly bodies. The [latter] thesis [in the *Metaphysics*] would be true

¹¹Averroes, *Commentaries on Aristotle's On Generation and Corruption*, edited and translated by Samuel Kurland (Cambridge, MA., 1958) English 133-34, Hebrew 122. Aristotle, *On Generation and Corruption*, II:10, 336a15-336b15. In this passage Gersonides seems to be alluding to the roles of the heavenly bodies in the cycle of generation and destruction of terrestrial phenomena. This process, Gersonides insists, is regular; even the differences amongst natural phenomena exhibit order.

¹²Averroes, *Tahāfut al-Tahāfut*, trans. S. von den Bergh, vol. 1, Fifteenth Discussion.

¹³Aristotle, *On Generation and Corruption*, Bk. II:10, 336b5-15.

¹⁴Aristotle, *Metaphysics*, XII:8, 1074a27-31.

-32-

if it is assumed ^k that these motions are for terrestrial phenomena. For, since what emanates from the spheres to the earth does so via the heavenly bodies, and since what emanates from the latter does so by means of the motion that brings ^l the heavenly body at one time close to some place on the earth and at another time farther away from it, it is evident that on this hypothesis it would be true that the movements of the spheres are for the heavenly bodies. This will be given a complete proof later on in this book; i.e., [it will be proved] that it is necessary for the movements of the spheres to be for the benefit of terrestrial phenomena. ¹⁵The Prophets and the Torah are in accord with this view. For God (may He be blessed) says to Job: "Knowest thou the ordinance of the heavens? Canst thou establish the dominion thereof in the earth?" ¹⁶This indicates that the heavenly bodies provide for the sub-lunar world and direct and influence it. The term "dominion" [mishtarō] is used [in this verse], since ^m this word in Hebrew connotes that the man who has dominion is supervised by someone else, who is the [real] ruler. The same is true with respect to the heavenly bodies; for their providential activity derives from one ruler who rules over them, i.e., God (may He be blessed), as shall be explained in the sequel (God willing). On the other hand, the statement of the Prophet (may he rest in peace) to Israel, "Be thou not dismayed at the signs of heavens," ¹⁷ indicates that anyone ⁿ to whom divine providence attaches has no need to be afraid of the evils that can happen from the heavenly bodies, as has been already explained. ¹⁸For this reason when the Torah describes the creation of the heavenly bodies, it mentions that this creation was for the perfection of the sub-lunar world, as we shall show in our explanation of the story of creation as presented in the Torah. ¹⁹Accordingly, King Solomon (may he rest in peace) says: "The Lord by wisdom founded the earth; by discernment He established the heavens." ²⁰The term "wisdom" [hokhmah] in Hebrew connotes the knowledge of things by means of the essences of those things themselves. The word "discernment" [tevunah] in Hebrew connotes the ability to derive from one thing information about something else quite different from it. Thus, philosophy is called ^o in Hebrew "discernment", as is clear from many places in the *Book of Proverbs*. For discernment involves analogical

¹⁵Gersonides, *The Wars*, vol. 3, Bk. 5?, pt. 2, chap. 3.

¹⁶Job 38:33.

¹⁷Jeremiah 10:2.

¹⁸Gersonides, *The Wars*, vol. 2, Bk. 2, passim; Bk. 4, passim.

¹⁹*The Wars*, vol. 3, Bk. 6, pt. 2.

²⁰*Proverbs* 3:19. I have translated the term "tevunah" in the second clause as "discernment" to accommodate Gersonides' subsequent interpretation.

-33-

reasoning and employs widely accepted principles; but these principles do not yield essential [i.e., necessary], truths. ²¹ Thus, our Rabbis have said that a man of discernment is able to infer from one thing something else. ²² Now, since knowledge of the natural phenomena in the sub-lunar world involves [knowing] the essence of these very things, and since it is evident that that which is known of these things -- and this is the law,^p order and rightness they embody -- is the very principle of their being, as has been pointed out in Book One of this treatise, Solomon says that God (may He be blessed) has established the earth in this manner [i.e., with wisdom]. For those things that follow necessarily from other things among natural phenomena in the terrestrial domain do so in this way; e.g., heat [necessarily] heats and cold [necessarily] makes things cold. This is evident from the causes that are assigned^q for these phenomena in the natural sciences.

On the other hand, since what derives from the heavens does not proceed in this fashion -- since the heavens do not possess those things [i.e., the four elements] from which the influence upon the terrestrial world would derive; ²³ [rather,] they exhibit an arrangement^r [i.e., an order] by virtue of which their influence proceeds according to the divine power they possess from God -- Solomon says that God made the arrangement of the heavens in this [particular] way with discernment, so that^s from them will emanate in this way what is required for the benefit of the sublunar world. This type of necessity^t is not of the same type of necessity that obtains in the mutual [connections] amongst terrestrial phenomena, for the heavenly spheres do not have the primary qualities that influence the sub-lunar world, as has been proved in the sciences. ²⁴ This point is repeated many times in the prophetic books; i.e., from the heavens are ordered [many] activities [influencing] sub-lunar phenomena. And since this feature in the heavens^u is quite obvious, ancients erred in thinking that the heavenly bodies were gods, which view is well-known. Their

²¹ According to this distinction, discernment involves the use of analogy and the dialectical syllogism, which Aristotle claims employs only accepted truths, not premises that are really known to be necessarily true. A syllogism having the latter type of premises is a demonstrative, or scientific syllogism, which for Gersonides constitutes wisdom; for the necessary truths on which these proofs are based are truths about the essences of things (Aristotle, *Posterior Analytics* 1; 2 and 4; *Topics* 1:10-12; Maimonides, *Treatise On Logic*, chap. 8).

²² B.T. Haggigah, 14a.

²³ The heavenly domain is not constituted by or composed of the four basic elements but consists of the fifth element, aether (Aristotle, *On the Heavens* 1:2).

²⁴ Gersonides, *Commentary on Proverbs, ad locum*. There Gersonides points out that the causal influence of the heavens upon the earth does not obey the usual natural laws; they are causally efficacious by virtue of God's will (*The Wars*, Bk. 6, pt. 1, chaps. 7-9).

error was that they thought that the influence from these bodies derived from themselves [alone] without any cause prior to them. But this is clearly false, for from many things *one* act cannot derive unless it is ordered from one cause, as shall be explained later on. ²⁵ Thus, it is evident that there is one cause prior to the heavenly bodies that makes them partners^v in one concerted action, and this^w is the providence operative in the lower world.

²⁵ *The Wars*, Bk. 5, pt. 3, chap. 5.

CHAPTER II

IT is necessary that we investigate here the nature of the body that does not preserve its shape, which exists between the spheres of one heavenly body and those of another heavenly body, as was demonstrated in the preceding part of this book. ¹Does it possess some kind of form, as is the case with all other natural phenomena? Or does it lack form completely?

It would seem that it has no form, for to say that it has a form but does not exert any particular kind of activity is to utter an absurdity. And since this body has no motion itself but is merely an instrument whereby all the movements of one heavenly body are prevented from interfering with the movements of another body, it is evident that it does not itself possess a form. Rather, it exists so that by virtue of it the individual movements of the heavenly body are perfected, as has been explained. This is similar to the parts in animals that are not [themselves] living, e.g., the bones, etc., [but] which make possible the perfection of the individual movements [of the animal].

However, a serious difficulty follows from this hypothesis. We do not see among the bodies in the sub-lunar world any body without form, as has been explained in the sciences. And if it is impossible for bodies that are generable and corruptible, which hardly possess any life and perfection, to be formless, it is all the more impossible for a heavenly body to be without form, especially since it is continuously living and perfect.

Nevertheless, these remarks cannot refute that which has been proven by sense observation. For these remarks are based upon a comparison between the heavenly bodies and bodies in the sub-lunar world; whereas it has been pointed out in the sciences that the term "body" is

¹*Ha-gwshem ha-bilti shomer temunato*; literally "the matter that doesn't preserve its shape." Gersonides discusses this topic in chapter 130 of the astronomical treatise that originally constituted part one of Book Five but which was omitted in most of the manuscripts and in the two printed editions. This body was introduced by Gersonides to avoid both the Aristotelian assumption of counteracting spheres (*Metaphysics XII*: 8, 1074 alff) and the Ptolemaic doctrine of the rubbing of the spheres. This matter has the character of a fluid. For this and other technical astronomical points, I am indebted to Professor Bernard Goldstein's important studies, many of which are included in his *Theory and Observation in Ancient and Medieval Astronomy* (Variorum Reprints: London, 1985). See also Jacob Staub, *The Creation of the World According to Gersonides* (Chico Cal., 1982), 95-99, 195213; and Gad Freudenthal, "Cosmogonie et Physique chez Gersonide", *Revue des Etudes Juives* 145(1986), 295-314).

equivocal with respect to the heavenly bodies and terrestrial bodies. Whatever [argument] is of this sort does not yield a necessarily true judgment. Moreover, this feature ^a [i.e. the presence of form] which is found in sub-lunar bodies follows from the fact that their forms are corporeal and change in mixture from one contrary [quality] to another accrues to them. ²Because of this, they always have some qualities, ^b [even] with the loss of their form, ^c and [eventually] they necessarily acquire that form which is related to their mixture. Hence, they are always with form. On the other hand, since the heavenly bodies do not have corporeal forms nor mixtures, they are not necessarily subject to this [i.e. the possession of form]. Moreover, just as in the terrestrial domain there are bodies that are hardly alive whereas other bodies are alive to the maximum degree possible for terrestrial bodies, so too is it possible for celestial bodies to exhibit different degrees

of this attribute [i.e., life], such that some parts of them are alive to the maximum degree possible for such bodies, i.e., the stars and planets, since the activities that emanate from the heavenly domain ^d are ordered by them and the movements of the spheres are for them, as shall be explained. ³ There are, however, parts of the heavenly domain that are utterly devoid of life; i.e., the bodies ^e that are between the spheres of one heavenly body and the spheres of another. That which is intermediary between these [types] of existence are the spheres [themselves], according to their various levels [of life]: those spheres in which stars and planets are fixed are inferior to these latter bodies with respect to life; after them [in rank] there are the spheres that enable the motions of the [former] spheres to reach the sphere in which the star or planet is located. ⁴

Furthermore, it is the nature of contraries to be received by one subject either at different times or in different parts [of the subject]. Now, since the characteristic of preserving shape is the opposite of not pre-

²The mixture [*mezeg*] is that which results from the combination of the four primary qualities, or elements, in the body. This mixture serves as the preparation for the reception of the form (Aristotle, *On Generation and Corruptions*, I:3, II:2-3, 8).

³Gersonides, *The Wars*, vol. 3, Bk. 5, pt. 2, chap. 3. Aristotle, *Metaphysics XII:8*.

⁴Gersonides distinguishes here four types of celestial bodies. The highest in rank are the stars or planets themselves, placed in first rank because they are the sources of influence upon the terrestrial world. At the opposite extreme is this "body that doesn't keep its shape," whose lack of definite form makes it lifeless. In between are two kinds of celestial spheres: the first and higher in rank are those that contain and carry the planet or star; the second are the "auxiliary" spheres that are needed to facilitate the motions of the primary spheres. Gersonide's discussion here alludes to the doctrine of homocentric spheres introduced by Eudoxus (ca. 408-355 B.C.) and accepted with some modifications by Aristotle. (Aristotle, *Metaphysics*, XII:8, 1073b17-1074a18.). J.L.E.Dreyer, *A History of Astrotronomy From Thales to Kepler* (New York, 1953), chaps. 4 and 5. C. Touati, *La Pensée philosophique et théologique de Gersonide*, 301-02).

servicing shape, and since it is impossible for the heavenly body to have either of these features at different times because it is incorruptible, ⁵ it receives these characteristics in different parts [of itself]. And just as the heavenly body receives the features of emitting light and of non-transparency in specific regions of the heavens, i.e., the stars and planets, and transparency and non-emission of light are found in other regions, so too is it possible for the celestial domain to receive the characteristic of preserved shape in some specified parts and lack of preserved shape in other parts.

Finally, since all the heavenly bodies participate in one common activity, i.e., the provision for the sub-lunar domain, and since this provision derives from them by virtue of the various motions of the individual planets, (as has been explained and will be elucidated in detail later on), these inanimate parts of the celestial domain (considered as a unified system) [serve] to perfect the particular motions of the heavenly bodies so that their total [order] is achieved. This is also the case in living creatures; in each organism there are parts lacking life, e.g., the bones, that serve to perfect the particular movements of the organism and its total [order].

⁵The heavenly domain is incorruptible. To admit contraries at different times is to undergo change, which means for Aristotle that it is subject to corruption (*On the Heavens*, I:3).

CHAPTER III

IT is necessary to determine at the outset whether the stars and planets are in the spheres for their own sake or for the benefit of the sub-lunar world. This question is very obscure and problematical. Observation suggests that the movements and measurements of these bodies are the most perfect possible for the perfection of the sub-lunar domain, such that if this order were to be destroyed, the sub-lunar world would also be destroyed, as shall be explained afterwards. We have mentioned this many times in this treatise; Averroes, too, explicitly ^a mentions this in his *Middle Commentary on the Heavens*. ¹ This indicates that the stars and planets exist in some sense for the benefit of the sub-lunar world. It was believed, however, that this could not be the case, for if it were true, the superior would exist for the inferior. ² ^b Accordingly, some of the modern philosophers maintained that these bodies are in the spheres just for themselves, and that whatever emanates from them upon the sub-lunar world is by way of secondary intention. ³ Nevertheless, it would seem that from what Aristotle says in his scientific writings and the *Metaphysics* that the heavenly bodies exist for the benefit of sub-lunary phenomena. ⁴ It, therefore, is proper that we consider this question at this time. We have decided to take up this question before we investigate into the causes of the other phenomena that we originally intended to discuss in this part of this Book, since this inquiry is pertinent to all the heavenly bodies, and it is proper to consider those factors that are common to all the heavenly bodies before inquiring into the specific features of particular heavenly bodies.

It has been demonstrated in the sciences that the fifth body [i.e. the fifth element which the heavenly bodies exemplify] is distinguished from living creatures in the sub-lunary domain, in so far as the substratum for its form is simple ^c and there is no potentiality in its essence. ⁵ We have called the fifth element [*ha-homer ha-hamishi*], however, [it is] a "substra-

¹ Averroes, *Middle Commentary on On the Heavens*, (Latin) II, 139D.

² Maimonides, *Guide*, II:11.

³ Averroes, *Tahāfut al-Tahāfut*, XV, 294-95, 299. George Vajda, *Isaac Albalag*, (Paris, 1960), 213.

⁴ That is, their influence upon the lower world is by way of first intention (Aristotle, *Physics* II:8; *Parts of Animals*, I:1; *Metaphysics*, XII:8).

⁵ Aristotle, *On the Heavens*, I:2-3; *Metaphysics*, IX:8.

tum" only in a loose sense, although strictly speaking it is not a substratum, as has been explained in the sciences. ⁶ When this point is appreciated, it is clear also that a sub-lunar living creature possesses organs both because of its composite nature and for the perfection of its existence and preservation, which goals require many organs. With respect to its composite nature, [organs are required] for the purpose of preserving the appropriate equilibrium amongst the contrary [qualities] of which the creature is composed: the organism is endowed with different organs, such that one of them is responsible for the preservation of one contrary quality, whereas another organ is responsible for another contrary quality. For example, in an animal the gall bladder is the locus of the quality of dry heat; the spleen is the locus of the quality of dry cold; the liver is the locus of the quality moist ^d heat; and the brain is the locus of moist cold. With respect to the perfection ^e of its existence and the preservation of the organism, the creature is endowed with many organs, and these are the limbs ^f in their totality that are present in it, as has been explained thoroughly in the section dealing with the purposes of the limbs of the animals in the *Book of Animals*. ⁷ Now, since it is clear that an animal requires organs both because it is composed of contraries and it needs [instruments] for its existence and preservation

(as far as this is possible), and since it is evident that the heavenly bodies are not composite -- for they are completely simple and do not need organs for their existence and perfection, since they exhibit no essential potentiality as do animals, which, for example, require food to replace what is decomposed in them -- it is evident, therefore, that the heavenly bodies do not need organs merely ⁸ because they are animate. From the latter aspect, it was thought that the heavenly body had to have organs, for it is said in *On the Soul* that the soul is the first perfection, [or actuality,] of a natural body having organs. ⁸ This [definition] led some people to believe that the heavenly bodies have organs since they are animate, but when it is understood that it is not a condition of the heavenly bodies that they have organs even though they are animate, it is evident that [the mere presence of] a star or planet [in a heavenly sphere] has no effect in making the sphere animate. ⁹ From this,

⁶A true substratum is a composite of matter and form such that in principle the matter can be a substratum for different forms. The fifth element, or the celestial matter, however, does not admit different forms: there is no substantial change in the heavens. Hence, a different kind of metaphysical analysis is required for the heavenly bodies, a problem that was discussed by the medievals. (H. Wolfson, *Crescas' Critique of Aristotle*, (Cambridge, MA., 1929) 99-113, Prop. X and notes).

⁷Aristotle, *Parts of Animals*, IV, passim.

⁸Aristotle, *On the Soul*, II:1, 412a 20-412b 9.

⁹If the star or planet makes the sphere animate, then it would be an organ. But as an organ it would be subordinate to the sphere, which is contrary to Aristotle's view in *Metaphysics*, XII:8. The spheres are animate independently of the presence in some of them of a planet or star.

it can be seen that the stars and planets are not in their spheres for the [benefit of] themselves.

Moreover, even if we were to admit that it is necessary for heavenly spheres to have organs because they are animate, it would still be the case that the stars and planets have no effect in making them animate. It is impossible to claim that it is the star or planet that is the organ which the sphere requires in order to be animate, for the organ that makes something animate is in all the members of the species numerically one, found in one place, of one nature, and has a size proportionate to the size of its body. This is obvious. For example, you don't find the heart located in the middle of one man's body but in another it is located in his head or feet, or in another man there is no heart [at all], or in some more than one heart. Moreover, in normal men the size of the heart is the same in all members of the same species. Now with respect to the stars and planets, these conditions ^h pertaining to organs by virtue of which a thing is animate do not obtain. For in some spheres, there is only one heavenly body, and it is located in the middle; whereas, in other spheres, there are many bodies, some located in the middle of the sphere, others near the poles, and others between the poles and the middle. In addition, such bodies are not equal to each other [in size], nor are differences in their sizes proportionate to the differences in the sizes of their spheres. Indeed, some spheres don't have any stars or planets at all, as has been explained. Moreover, the light ⁱ [zohar], by virtue of which the planet or star is what it is -- for it is a heavenly body because it emits light, and it emits light because of its own light -- is not the same in these bodies. For in some planets or stars the light comes from these bodies themselves, whereas some receive their light from others. In some the light is red, in others white ^j, and in others it is a different color. It is evident, therefore, that the star or planet has no effect in making the sphere animate, even if we were to admit that the sphere is described ^k as having an organ [merely] because it is animate. ¹⁰

Furthermore, light as such, does not seem, even in sub-lunar phenomena, to have a role in making ^l its subject animate, for the color has no role in nature in this matter. Nor is it possible for someone to say in *which way* the light is relevant in making the body animate, even if he wants to invent some kind of fictional theory, unless one were to suggest that in so far as the spheres apprehend something ^m of the law, order and rightness

¹⁰Touati, *La Pensée*, 303-04.

of the sub-lunar world and as a result of this very apprehension they desire to do something to perfect this order, it is necessary that they have an organ, [or instrument], to accomplish this activity, and this organ is the planet or star. ¹¹ This suggestion, however, implies that the stars or planets are not in the sphere for their own sake but [are there in order] to bring about what the apprehension of the spheres necessitates with respect to the perfection of sub-lunar phenomena. ¹² For the apprehension is sufficient for the spheres, in so far as they have intellects; they do not need another kind of activity in order to constitute their being. And if we were to admit that motion is appropriate for them because they are animate, as some of the ancients believed, it would not follow from this that the spheres must have stars or planets in them or that their motions must be as they are, [i.e.,] in this extraordinary manner, through which alone the sub-lunar world is perfected. This point will be further elaborated in Book Six. ¹³ It is therefore evident that the planets or stars are not in the spheres for their own sake but for the purpose of influencing the terrestrial world.

Nevertheless, if this is the case, the previously cited difficulty reappears: it would follow from this thesis that the superior kind of being exists for the inferior, and this ⁿ has been thought to be utterly absurd. Now, although we do admit that it would be false to assert that the superior exists for the inferior, it is not impossible [to say] that there is *something* in the superior being that exists for the inferior. Rather, there is, [indeed], such a feature, and in this manner the superior being is able to influence and act upon the inferior, e.g., God (may He be blessed) acts upon and provides for that which is inferior to Him, and the Agent Intellect acts upon the sub-lunar world. Now, this influence exists in it for the sake of terrestrial things. In the very same way, ^o the luminosity and emission of light found amongst the stars and planets are for the benefit of the sub-lunar world, whereas their essences are for themselves. We shall complete our investigation of this topic in Book Six.

¹¹That is, this thesis argues, since the spheres provide for the sublunar world, they need some kind of instrument, or organ, for this purpose. This instrument is the star or planet embedded in the sphere. Accordingly, the star or planet is what makes the sphere animate.

¹²Even if this hypothesis is granted, it still follows that the stars and planets exist not for themselves but for the sub-lunar domain, which is what was to be proved.

¹³*The Wars*, Bk. 6, pt. 1, chaps. 7-9.

CHAPTER IV

IT is necessary to determine whether there is a sphere above the sphere of the Zodiac that is without any stars or planets and that moves diurnally, as some of our predecessors here believed,

such as Ptolemy and alBitruji. ¹ Or is it the case that there is no such sphere, as Averroes maintains? ² Each of these positions has been supported by arguments.

It has been thought that it is necessary to postulate the diurnal sphere above the sphere of the Zodiac, since we observe that this sphere alone moves with a simple motion. Hence, it is necessary that the uppermost sphere be of this type, for [in general] all those spheres containing a heavenly body that are near the basic elements have a more complicated motion. Thus, whatever is the most distant from them ought to have the most simple motion. Moreover, such a simple motion [i.e., diurnal rotation] ought to be manifested by a simple body, but the sphere containing a star or planet is in some sense compound, and hence, the diurnal motion should be performed by a sphere without any stars or planets. Furthermore, the first sphere ought to be simple, since the simple is prior to the composite, and the first sphere is prior to the other spheres since it encompasses them. Thus, it is necessarily more noble than they are, for that which encompasses is superior to that which is encompassed, as is evidenced by the elements. ³ Accordingly, since the sphere of the stars [i.e., the Zodiac] is composite in some sense, it cannot be the first sphere; rather, there must be another sphere beyond it that has no stars or planets and that encompasses all the spheres. Again, just as we find ^a that all the other movements of the heavenly bodies first have simple [i.e., specific] motions and afterwards composite motions -- e.g. the motion of the sphere of the fixed stars is first exhibited as the specific motion of this

¹The diurnal motion is the daily rotation of the heavens east to west around the earth. The thesis that there was a distinct diurnal sphere above the Zodiacal sphere was advanced by Ptolemy in his *Planetary Hypotheses*, a summary of which appears in P. Duhem, *Le Système Du Monde*, (Paris, 1954), vol. II, 86-99. Gersonides refers to al-Bitruji by the phrase "the master of the new astronomy". *The Latins knew him as "alpetragius"* (S. Munk, *Mélanges De Philosophie Juive Et Arabe*, (Paris, 1955), 500, n. 1, 518-22. Duhem, *op. cit.*, 146-56. Maimonides, *Guide*, II:4. B. Goldstein, "Preliminary Remarks on Levi ben Gerson's Contributions to Astronomy", *The Israel Academy of Sciences and Humanities Proceedings*, 3(1969), 8).

²S. van der Bergh, *Die Epitome der Metaphysik des Averroes*, (Leiden, 1924), 114.

³Fire is the "outer" element, and was regarded as the superior element (Maimonides, *Mishneh Torah*, *Sefer ha-mada*, I: c.3).

sphere, and afterwards, [this motion] is found combined with the motions of the other [heavenly bodies]; and similarly, the motion of the sun is at first simple with respect to the sun but composite with respect to the motions of Venus and Mercury -- so too is this the case with the diurnal motion, i.e., it is a motion that belongs to a specific sphere. ⁴

[Nevertheless,] from another point of view it can be shown there is no diurnal sphere above the sphere of the Zodiac. The movements of the spheres, as can be seen from their very natures, are for their stars or planets, as we have pointed out and shall demonstrate later. Aristotle has explicitly mentioned this fact in the *Metaphysics*, as we have alluded to previously. ⁵ Accordingly, it is evident that there cannot be a diurnal sphere of this description, for a sphere that has no star or planet and that is not subservient to a sphere which does have a star or planet would have a motion that would serve no purpose, and nature would find this repugnant. ⁶ For this reason, Averroes maintained that the assumption of a diurnal sphere above the sphere of the Zodiac is gratuitous. It is, therefore, incumbent upon us to examine this question.

We maintain that since the movements of the fifth body [i.e., the heavenly domain] are for the benefit of the terrestrial domain (as has been shown), and since it is better that more than one activity emanate from the former upon the latter so that the many things in the sub-lunar world are perfected, and since it is evident that the emanation of many activities from one heavenly body results from the diversity of its movements and relations to the various places on the Earth - it is evident that it is impossible to attribute a simple motion to the most superior heavenly sphere. All the more so is it impossible to deny that it has some heavenly body, for if the motions of the spheres be regarded as beneficial for the earthly domain by way of first intention, as we have demonstrated, this hypothesis is clearly false. And if [these movements] are beneficial for the sublunar world only by way of second intention (as some of the modern thinkers maintain) because of the super-abundance of their perfection -such that it would be better and more noble [for such spheres] to influence others than not ⁷-- it is evident that this kind of influence belongs to the most perfect of all heavenly bodies [i.e., the Zodiacal sphere]. Hence, this hypothesis is false, no matter how the matter [of first or second intention] is posited.^b

One of the premises in this argument, however, is not true in any case, i.e., that since the simpler is prior to the composite it is necessary that the

⁴This is the position of *al-Bitruji* (Munk, *op. cit.*, 520. Duhem, *op. cit.*, 149-51).

⁵Aristotle, *Metaphysics*, XII:8; Gersonides, *The Wars*, Bk. 5, Pt. 2, chap. 3.

⁶Aristotle, *On the Hemyens*, 1:4, 271a35.

⁷Maimonides, *Guide*, II:11.

first sphere be without stars or planets, for it is prior to the other spheres because it encompasses them. It is true to say that the simple is prior to the composite in some sense, but this kind of priority does not always imply the superiority of the simple over that which is compounded from it and from other things. Rather, the composite can function as the form and perfection of the simple, and this is evident in the world about us. For whatever in the primordial matter has greater composition [i.e., structural complexity] is more noble [than what has less complexity]. Thus, minerals are superior to the elements; plants are superior to minerals; animals superior to the plants; and man is superior to all animals. Now, we do admit that the simple is prior to that which is compounded from it and other things [in the sense of] material priority. ⁸[Accordingly,] the sphere of the fixed stars is the uppermost sphere encompassing everything, and below it is the diurnal sphere, as we have claimed previously. ⁹Now, the motion that is a composite of the diurnal and the slow ¹⁰

¹⁰*Ha-tenu'ah ha-mitàaheret* This motion is slower than the diurnal motion and its direction is contrary to the diurnal motion, i.e., its direction is west to east. Thus, each heavenly body moves diurnally east to west and has a slower motion of its own west to east. Ptolemy refers to these two movements as the "two prime movements in the heavens". (Ptolemy, *The Almagest*, 1:8, trans. G.J. Toomer, (London, 1984), 45-47; cf. Aristotle, *On Generation and Corruption*, II:10, 336a32ff).

⁸*Qedimah hayyulanit*, "material priority. In: *Metaphysics*, V:11. Aristotle distinguishes the various senses of the "prior-posterior" relation. One of these senses seems to underlie the notion of material priority: Aristotle mentions in passing that matter is potentially prior to substance (1019a8-9). Since for Aristotle the concepts of matter and potentiality are closely connected, the construction of a concept of material priority is not alien to his metaphysics. Matter is potentially prior to the substance of which it is a constituent in that its "existence is implied by, but does not imply, the existence" of the substance (Kirwan's commentary to his translation of *Metaphysics*, *Delta. In: The Oxford Clarendon Aristotle Series* (1971), 155). In

this sense, the marble is "prior" to the formed figure of the discus-thrower, and the menstrual fluid is "prior" to the fetus, yet neither the marble nor the fluid are complete substances; after all, even though they exist, they don't necessarily have to become a statue or a fetus or any substance at all. But without them, there will be no statue or fetus.

Gersonides' use of this notion fastens upon this latter idea of matter serving as a prerequisite for a higher or superior level of being, and in this sense it is prior. A passage in his *Commentary on Genesis* is relevant to the present context: "The separate intellects are prior in cause and being to the heavenly bodies, and the latter are prior in cause and being to the elements and to what is generated from them; [but] the elements are prior to minerals, and minerals are prior to plants, and plants prior to animals.... However, this [latter kind of] priority is *material priority*" (*Commentary on the Torah*, 9b [My italics]). In this text, as well as the present passage in *The Wars*, Gersonides makes use of the idea of the "chain of being," whereby the lower links in the ontological chain serve as material components for the higher links; as such, they are prior to the superior links, even though the higher links are prior according to "cause and being," or, as Aristotle expresses it, according to "nature and substance" (Aristotle, *Metaphysics*, V:11, 1019a2). Thus, even though the plants are prior to the minerals with respect to their substances and causal power, minerals are prior to plants in so far as they are matter for the plants, just as plants are matter for animals. (Gersonides, *The Wars of the Lord*, vol. 3, Bk. 6, pt. 2, chap. 8. Touati, *La Pensée*, 269.

⁹*The Wars*, Bk. 5, pt. 1, chaps. 29-30. According to Gersonides' astronomical theory, each heavenly body has its own diurnal sphere, i.e., its lowest sphere, which moves the higher spheres. I owe this point to Professor Bernard Goldstein.

-45-

motions, [and which] is a feature of the sphere of the fixed stars, is [actually] the perfection of the diurnal motion which belongs to the sphere below it.

The counter-argument ^c that since the spheres containing stars or planets which are nearer to the elements have more composite motions, whereas those spheres that are farthest away from them have the simplest motion, and thus the first sphere ought to have a simple motion is not valid. What does follow is that just as the sphere containing heavenly bodies that is closest to the elements ^d has the most complex motions, so the sphere containing a heavenly body that is farthest away from the elements has the least complicated movements. And this is the case on our assumption that the sphere of the fixed stars is the first sphere, for every other sphere containing a star or planet has a more complex movement than the sphere of the fixed stars.

The argument that the diurnal motion ought to belong to a sphere having no star or planet, even if it is accepted, does not entail that the first sphere has no star or planet, for such a motion could belong to a sphere having no star or planet that is below the sphere of the Zodiac, as we have suggested in our model of the sphere of the fixed stars.

The argument that there is a diurnal sphere above the Zodiacal sphere because in the other motions that are common to many heavenly bodies, the motions are first simple [and] afterwards composite is not valid. This is true for motions that naturally belong to stars or planets, and they are composite, such as the movement of the Zodiacal sphere, which is a composite of the diurnal motion and the slow motion, and such as the movement of the sun, which is a composite of three motions. However, this is not true in the case of a simple motion, for such a motion is not appropriate for a sphere ^e in order to influence the sub-lunar world with respect to what is required for the many things that are generated, as has been explained, even though there is in the sphere a planet or star.^f All the more so is it inappropriate to maintain that a sphere having ^g

no star or planet and having a simple motion is not subservient to a sphere having a star or planet. Such a motion would be gratuitous for this sphere, since it would have no use in influencing the sub-lunar world, for the influence of the spheres upon the sub-lunar world is by way of the stars or planets. And in nature there is nothing gratuitous; all the more so is there nothing gratuitous in these noble bodies. Hence, there is no diurnal sphere above

-46-

the sphere of the Zodiac, as some of the ancients maintained. We thus have completed our aim of this chapter.

-47-

CHAPTER V

LET us now investigate whether all the fixed stars are in one sphere, as we have assumed, or if each of them has a [distinct] sphere. We believe that they all belong in one sphere, and for several reasons.

First, these stars manifest the same distance from each other, as Ptolemy has pointed out, ¹ and this indicates that they are all in the same sphere. For if they were not in the same sphere, I would be very much puzzled how all these many spheres would have the same motion and poles, whereas the other spheres [i.e., the spheres of the planets, the sun, and of the moon] are such that no two have the same motion or poles.

Second, since it is possible for the observable motions ^a of these stars to be completed by means of one sphere just as much as with many spheres, and since in nature there is nothing in vain, especially in the case of these everlasting bodies, it is obvious that they must all be located in one sphere. For if they were in different spheres, the existence of a plurality of spheres would be superfluous, since that which is accomplished through them can be effected by one sphere.

Third, in those spheres having only one heavenly body [e.g. the sphere of Saturn], the distance of this body from the poles of the sphere is uniform or nearly so. This is proper for such bodies, for this place is the best place in the sphere with respect to velocity. And it is proper that the body be in the best place in the sphere, since ^b the body is the most superior part of the sphere, as can be seen from its activities, which have been discussed previously. Moreover, when the body is in this place, it is sometimes possible for it to appear in the horizon in any part of the Earth; this would not be possible for the body if it were near one of the poles. And it is better that its activity extends over all parts of the Earth than just in one particular part of it. ² Now, when it is understood that it is proper in a sphere having ^c only one body that the distance between the body and its ^d poles be uniform or nearly so, and that it is obvious that this would not be the case with the fixed stars if each of them were to have a sphere [of its own], it is evident that all the fixed stars are located in one sphere.

Now the plurality of fixed stars in [this one sphere] can be accounted for in two ways. First, since this sphere has only one motion besides the diurnal motion, and because of this -- if there were in the sphere only one

¹Ptolemy, *The Almagest*, VII:1.

²A constant distance makes for uniform emanation of influence.

planet or star^e -- it, therefore, would be impossible for a plurality of activities [or influences] to emanate from it for the requisite perfection of terrestrial phenomena, nature establishes a balance in this regard, (as Aristotle has put it)³ by placing in it many stars instead^f of many motions. In this way, many activities emanate from this sphere. Second, in this way, the sphere [of the fixed stars] is to some extent the cause of the diverse activities possessed by the planets.⁴ For in this sphere, there are stars that have different activities, as can be seen from the differences in their colors^g and from the different influences^h of the planets when they are in different parts of the [sphere of the fixed stars]. This is obvious to anyone who is even only slightly familiar with astrology. Now the stars not in the Zodiac are also involved in this [process], according to whichever of them ascends on the horizon at any given placeⁱ and [according to] whichever of these stars^j crosses the meridian along with the planet.⁵ For^k in this manner, different influences result from one and the same planet when it is in one place relative to the Zodiacal sphere in different horizons.

And thus it has been explained why there are many stars in the first sphere, why there is only one heavenly body in each^l of the spheres below the first sphere, and why the sphere of the fixed stars has only one motion [besides the diurnal rotation], whereas the other spheres having bodies exhibit many [kinds] of motions. It [also] has been demonstrated that the fixed stars are all in one sphere.

³Aristotle, *On the Heavens*, 11:12, 293a4.

⁴Here Gersonides uses the term *Kokhavim Ratzim*, which can mean shooting stars' (I. Klatzkin, Thesaurus, see under "Kokhav"; Aristotle, *Meteorologica*, 1:4, 341b3). However, in this context the term connotes planets, as the whole discussion indicates. Shooting stars do not have continuous influence upon the earth, nor do they remain in the horizon. In Bk. 5, pt. 1, chap. 3, Gersonides also uses the expression *Kokhavim Ratzim* to denote planets (B. Goldstein, *The Astronomy of Levi ben Gershon*, 28 English, 299 Hebrew).

⁵This sentence is quite difficult:



The last clause is especially recalcitrant. The printed editions diverge from the manuscripts and the latter differ amongst themselves. In my translation, which is tentative, I have been helped by Dr. Tzvi Langermann of the Institute of Microfilmed Hebrew Manuscripts in Jerusalem

CHAPTER VI

IT is proper that we investigate how the sun heats the air, for this is a very obscure problem and is common in some sense to all the heavenly bodies. For when we understand how this activity derives from the sun, it will become clear how from the other heavenly bodies their activities emanate, such that each heavenly body is individuated by them.¹

The sciences have demonstrated that the heavenly bodies do not possess the qualities that are found in the elements and in the compounds from the elements.² Hence, it is impossible to claim that the sun heats because it is hot. And since it has been proved by general principles^a that anything which brings something else from a state of potentiality to actuality with respect to a particular feature has that feature in actuality which is potentially in the recipient of its activity,³

it would seem to follow from this that either the sun is hot or the heat derives from it essentially, for if this is not so, I do not know how the heat comes from the sun to the sub-lunar world. Or [perhaps] the heat does not derive^b essentially from the sun at all. Since it is impossible to claim that the sun is [itself] hot, as has been indicated, it would appear that the heat does not derive essentially from the sun at all; rather, the existence of heat derives from something whose existence is a consequence of the sun. Accordingly, it has been thought that the sun heats, [although] this is not the case. Since this has been demonstrated, it is appropriate that we determine what this thing is [that is responsible for the heating of the air].

Aristotle gives two explanations of this matter. First, the reflection of the light emitted by the sun [produces heat]; for it is the nature of light (by virtue of its divinely given power) to emit heat when it is reflected.

¹This problem is generated by the Aristotelian thesis that the sun does not heat the air or emit heat at all by being hot itself; rather, it emits heat by its motion. This thesis, Aristotle believed, was implied by his theory that the heavenly domain is constituted by the fifth element, the aether, not by any of the earthly elements, such as fire (Aristotle, *Meteorologica*, I:3; *On the Heavens*, I:2, 11:7). Aristotle's explanation of solar heat was controversial in late antiquity, as John Philoponus' discussions reveal. Philoponus (fl. 517 - 70) rejected Aristotle's thesis and discusses a theory similar to the one eventually propounded by Gersonides: the sun heats by virtue of its light. But ultimately he opts for the older idea that the sun heats simply because it is hot; i.e., the sun is a fiery substance. This was Plato's view (R. Sorabji, ed., *Philoponus and the Rejection of Aristotelian Science*, Ithaca, 1987, 25; W. Böhm, *Johannes Philoponus: Ausgewählte Schriften*, Munich 1967, 320-24).

²Aristotle, *On the Heavens*, I, passim.

³Aristotle, *Physics*, III:2-3.

This can be seen easily in "burning mirrors" [i.e., spherical mirrors], as described by Aristotle.⁴ Since this reflection is greater when the sun assumes a position of a right angle, or nearly so, [relative to the earth, i.e., right over our heads], the heat given off by the sun is very strong in the summer, for then the sun is at a higher point in the horizon throughout the inhabited world than at any other time of the year.

Second, the motion [of the sun produces the heat]. For Aristotle says that the body of the sun is denser than any of the other parts of [its] sphere, and from^c its motion heat results, since it is the nature of motion to emit heat. The motion [of the sun] moves the elements and brings them into mutual contact, as the result of which the low level of heat in the elements becomes greater, just as a greater degree of health is generated from a lesser degree of health, according to Aristotle's discussion in the *Metaphysics*.⁵ In this way, Aristotle believed that the explanation of how the sun heats the air can be attained.⁶

Let us now examine these explanations of Aristotle. The explanation he gives in terms of the reflection of light^d is not correct, if he doesn't say more about it than he does, for the very same problem that was engendered by the assumption of the sun [itself] heating the air^e still remains^f. For light is not a body; all the more so it doesn't possess heat. Hence, I do not see how the light can heat [the air]. Moreover, if this heating is attributed to the light, in so far as it is light, it also should be assigned to the moon since it, too, emits light, although its light is not as strong as sun light. Indeed, the moon is closer to the earth, and sometimes, it comes closer to the zenith than the sun [ever does] in most of the inhabited world. And when it is at the beginning [rosh] of

Cancer, it is completely inclined in a northerly direction, and then ⁸ the time when it is opposite the earth is longer than the corresponding time of the sun when the latter is at the beginning of Cancer. Therefore, if it were true that light does the heating, it should be the case that the moon would warm the air considerably during that [long] interval, i.e., when the light of the moon is full and the moon is at the beginning of Cancer. This occurs when the nights are long. But observation reveals the contrary, for at that time [i.e., the winter] it is very cold.

⁴ Actually the reference is to Averroes' *Middle Commentary on Aristotle's On the Heavens*, where Averroes introduces the reflection of the sun's rays as an additional cause of the heating of the air. In this passage reference is made to "burning-mirrors", or spherical mirrors ("speculo comburenti"). Later in this chapter Gersonides will discuss this point in detail and make use of some experiments performed with this type of mirror (Averroes, *Middle Commentary on Aristotle's De Caelo*, (Latin, 126H).

⁵ Aristotle, *Metaphysics*, VII:7, 1032b4ff.

⁶ Aristotle, *On the Heavens*, 11:7; *Meteorologica*, I:3.

-51-

The explanation in terms of motion is also incorrect. The claim that the body of the sun is more dense than any other part of its sphere is clearly false, especially for Aristotle, since he believed that the fifth element [of which the celestial bodies consist] is uniform throughout. Moreover, this hypothesis is gratuitous, since it doesn't really show how the sun heats the air in this way. For bodies that produce heat in this way [i.e., by movement] heat up bodies that are in contact with them, and by means of the latter, they heat up other bodies, but the intervening bodies that are between the earth and the sun -- i.e., the heavenly bodies below it, [e.g., the moon] -- do not receive the heating. Hence, it would not be possible for the air to receive this heat in this manner. It may be objected that it is possible for something to be affected by another thing without the medium being affected ^h in that [particular] way. For example, a fish benumbs the hand ⁱ of a fisherman via the net, but the net itself is not benumbed. In reply, we say that the net is nevertheless affected ^j by a kind of remote affect, i.e., the cold that is the cause of the benumbing of the hand. However, the net is not benumbed, since it is not a living thing. ⁷

Moreover, it has been previously shown that the motion of the sun doesn't reach the spheres of the other heavenly bodies; hence, it is clear that it is not possible for it to reach the elements. ⁸ Rather, its motion terminates and ceases at the body that is between the spheres of the sun and the sphere of the heavenly body below it. ⁹

Furthermore, it is obvious that the body of the sun is much smaller than the sphere in which it is embedded. Thus, since it is the sphere that is [essentially] in motion, not the sun, it would be more appropriate to attribute the heating activity to the movement of the sphere than to the movement of the sun, for the motion [of the sphere] is uniform and equidistant from the elements. Now if this is the case, then it would follow that the heat would be continually and uniformly found in the air: the same amount in the night as in the day, in the winter as in the summer. But this is false. Again, if the cause of heat is motion, it would be more appropriate to say that the cause is the movement of the diurnal sphere, for it is the fastest among the motion of the spheres and it is also the closest to the elements ¹⁰ and [actually] reaches them such that we [can] observe this motion, especially [in the element] of fire and in the air that

¹⁰ According to Gersonides' theory of the spheres the diurnal sphere is not the outermost sphere (*The Wars*, Bk. 5, pt. 1, chaps. 29-30 and pt. 2, chap. 4).

⁷This example, indeed the whole discussion, is found in Averroes's *Middle Commentary on the Heavens*, (Latin, 125 E). This example seems to be based upon Aristotle's discussion of the torpedo-fish (Aristotle, *History of Animals*, IX:27, 620b 18-24).

⁸In the cosmological model of Aristotle, the spheres of the elements are below the sphere of the moon (Aristotle, *Meteorologica*, I:2-3).

⁹Gersonides seems to be referring to the body that doesn't preserve its shape which exists between the spheres (*The Wars*, Bk. 5, pt. 2, chap. 2).

-52-

is contiguous with fire. Accordingly, some of the burning flames generated^k in that region move along with the diurnal movement. But if this is so, the sun would have no influence upon the heating of the air; rather, the heat [deriving from the diurnal sphere] would reach [the air] uniformly, both in the night as well as in the day, in the winter as in the summer. But this is contrary to what is the case. Finally, if the cause of the heat in the air, which derives from the sun, is the motion [of the sun], it would be more appropriate to attribute this [activity] to the moon, since it is closer to the elements than is the sun and its motion is much quicker than that of the sun. And whatever is of this nature can more appropriately move the elements and bring^l them together. And if this is so, then the moon would have a strong influence upon the heating of the air. But this is not the case. Hence, it is evident that Aristotle (as far as we have gleaned from his interpreters) has failed here^m to explain adequately the role of the sun, amongst all the other heavenly bodies, in the heatingⁿ of the air.

Our theory is as follows. The cause of [this heating] is attributable to the ray of the sun which -- because of the relationship [or similarity] between the ray and the element of fire, by virtue of the divine power in the ray -- moves the fire and heats the air in this way because of the air's intermingling with the fire, and thus heats the air by means of the latter's intermingling with the fire. ¹¹And since^o when the ray is reflected, it multiplies itself to a great degree, this heat [of the ray] is [correspondingly] multiplied when the reflection is greater. ¹²This happens when the sun forms a right angle, for then the heat is very great. Empirical proof of this can be seen in "burning mirrors" [i.e., spherical or parabolic mirrors], where many light-rays are reflected and combine at one point, which is the locus of the burning. ¹³Accordingly, this phenomenon occurs in so far as the light is emitted from the *sun*, not because of the light as such. Since this occurs to the light of the sun because of the nature of the fiery ele-

¹¹Aristotle, *Meteorologica*, I:34. See H.D.P. Lee's notes in his edition (Loeb Classical Library). T. Langermann, "Gersonides on the Magnet and the Heat of the Sun". In: *Studies on Gersonides: A Fourteenth-Century Philosopher-Scientist*, ed., G. Freudenthal (Brill: Leiden, 1992), 276-82. Touati, *La Pensée*, 305-06.

¹²A similar point is made by Seneca, whose terminology is strikingly close to that of Gersonides: "*deinde quia radii solis replicantur et quousque redire possunt, id duplicato calore benignius fovent.*" "The upper regions of air [i.e., the region closest to the fiery element] feel the heat of the nearby stars. The lower regions are also warm; first, because of the exhalation of the earth...second, because the rays of the sun are reflected back ["*replicantur*"] and make the air more genially warm with reflected heat ["*duplicato calore*]. The two Latin words "*replicantur*" and "*duplicato*" seem to correspond to Gersonides' term *kafal* (Seneca, *Naturales Quaestiones*, II:10, trans. T. Corcoran, Loeb edition).

¹³At the "place of burning" the various rays converge and the heat at that spot is greater than at any other point; i.e., the heat is "multiplied". This discussion is also found in Averroes' *Middle Commentary on On the Heavens*, (126H). (N. Rabinovitch, *Probability and Statistical Inference in Ancient and Medieval Jewish Literature*, (Toronto, 1973), 125-27.)

For an excellent discussion of the use of such spherical mirrors in optical experiments consult A.C. Crombie, *Grosseteste and Experimental Science*, (Oxford, 1953), 95-96, 116-18, 19697, 218-19. Crombie notes that spherical mirrors were known to Euclid and the Arabic optical literature.

-53-

ment, which the rays of the sun move, this heating effect should also be found in the light emitted by fire when it is reflected. We have established this latter fact by our own observations: in juxtaposing a "burning mirror" opposite a candle, we find a [place] of burning at the point of contact of the reflecting rays. This is not so with moon-light: no burning is produced by moon-light. All of this shows that this ^p heating effect belongs ^q to the sunlight in so far as it is the light of the sun, by virtue of the divine power it possesses to move the fiery element.

In the very same way, the moon has some effect upon the increase in the nature of water. Observation reveals that water and moisture increase along with the increase of the moon [i.e., with the phases of the moon] and decrease with its decrease. Thus, the color of the moonlight is proportioned and appropriate to the cold and moist nature, whereas the color of sunlight is proportioned and appropriate to a hot and dry nature that is dry to a moderate degree. ¹⁴ Similarly is it with the colors [of the rays of] the other heavenly bodies: they are proportioned and appropriate to the nature [i.e., element] upon which that planet or star has an influence on its production. This is obvious to anyone who is even slightly familiar with astrology. Indeed, this is so because the activity of the heavenly body upon the terrestrial domain is a result of its rays. And since it is necessary in terrestrial phenomena that they have preserving causes of each of the contrary elements, from which they are all compounded, it is necessary that the colors of the rays of the heavenly bodies be different, so that these rays are appropriately [constituted] for whatever is to be derived from them for the perfection of the sub-lunar world. In this way, the heavenly bodies act upon the elements and the compounds made from them and keep them in equilibrium. May the Creator of the universe be blessed, whose wisdom in what He has brought forth cannot be completely fathomed by any knowers except Himself. Perhaps Aristotle, too, was of this opinion, for we don't have his own writings on this subject, and it is possible that his interpreters have misconstrued his [real] meaning on this topic.^f

There is a problem of considerable difficulty about the moon which should be disposed of. As we have said, the light of the moon has an influence upon the strength of the element of water and upon moisture. Thus, it would appear that water and moisture should increase or

¹⁴Ptolemy, *Tetrabiblos*, 1:4.

-54-

decrease according to the increase or decrease of the moon. Nevertheless, we frequently observe that there are rains when the moon has almost disappeared, i.e., about the time of the new moon. It should be the case that at that time dryness prevails. But this is not what we observe.

We suggest that it would seem that these phenomena [i.e., moisture and rain] cannot both be essentially derived from the moon. Rather, one derives from the moon essentially, whereas the other derives accidentally. The increase in moonlight implies essentially an increase in water and moisture; its decrease implies a decrease in them. Thus, you find a decrease in moisture in plants and animals when the moon wanes. [On the other hand,] rain occurs accidentally at the end of

the month because of the mixture between the rays of the sun and the rays of the moon, from which mixture the rays of the sun acquire the nature [of moisture]. Thus you find that the natural heat of sub-lunar organisms decreases at the new moon, as a result of which there can be danger ¹⁵[i.e., the crisis], which occurs to people who are ill at the time of the new moon. The mixture of the rays of the sun with those of the moon occurs at that time because the moon is then below the sun, and the illuminated part of the moon reflects back ^s its ray to the sun in the same direction that the rays of the sun come to us. Because of this, the rays of the sun come to us mixed with the nature of the rays of the moon.

¹⁵*Ha-ba'hran; al-bu'hrān*. This is the critical point in a disease when the patient becomes delirious (Klatzkin, *Thesaurus, ad locum*).

CHAPTER VII

THERE are twenty-seven ¹questions about the heavenly bodies that need investigation.

- I. Why do all the heavenly bodies participate in the diurnal motion ²and in the slow motion ³ even if the slow motion differs in them? And why are the apogees ⁴and the ascending nodes ⁵of the planets involved in these motions?

¹Although in this chapter twenty-seven questions are described, in chapter nine, where Gersonides gives the answers, only twenty-six questions are answered. The answer to question twenty-five seems to have been omitted. In the translation and notes of chapters 7-9, I have received invaluable help from Dr. Tzvi Langermann of the Jewish National University Library in Jerusalem.

²*Ha-tenu 'ah ha-yomit*, "the daily motion." In the Ptolemaic system, it is initially postulated that the earth is at the center of the universe and stationary. The sphere of the fixed stars is then assumed to make a uniform "daily", or diurnal, rotation around the earth in about 24 hours from east to west, carrying with it the sun, moon, and the planets [Ptolemy, *The Almagest*, trans. G.J. Toomer (London, 1984) 1:3. F.S. Benjamin and G.J. Toomer, *Campanus of Novara and Medieval Planetary Theory*, (Madison WI, 1971) 39).

³*Ha-tenu'ah ha-mit'aheret*, "the slow motion". In general, the "slow motion" of a heavenly body is its motion eastward. In the case of the sphere of the fixed stars, its slow motion is its precessional motion, as the "precession of the equinoxes", whereby the fixed stars do not maintain the same distances with respect to the equinoctial points [Ptolemy, *Almagest*, VII:2-3. Olaf Pedersen, *A Survey of the Almagest*, (Odense, 1974), 239ff].

Ptolemy identified the precessional motion of the fixed stars with the slow motions of the planetary apogees, i.e., where their longitudinal motions are the slowest; most of the medieval astronomers followed him. Some of the medievals began to believe that the two were distinct. Gersonides' discussion of question 1 indicates that he, too, was inclined to distinguish between these two motions [Neugebauer, *History of Ancient Mathematical Astronomy*, 3 volumes, (Berlin, 1975), vol. 1, 160-61].

⁴*Ha-merhaq ha-rahoq* "The farthest distance", or apogee ἀπόγειον. The apogee of a planet is its farthest position from the earth. The closest position of a planet to the earth is the perigee περὶγειον, *ha-merhaq ha-qarov* [Ptolemy, *The Almagest*, Introduction, 22].

⁵*Roshei ha-teninim*, the ascending nodes; literally, "the heads of the dragons". For the origins in Hindu mythology of this phrase, see Benjamin and Toomer, 379-80. The nodes are the points of intersection of the planet's orbit and the ecliptic. The (1) ascending node ("the head of the dragon") is the point where the planet in its motion in latitude moves from south to north; the (2) descending node (*zanav ha-teninim*, "the tail of the dragon") is the point where

the planet moves southward [Pedersen, 45. Maimonides, *Sanctification of the New Moon*, (The Code of Maimonides: Book three, treatise eight), trans, S. Gandz (New Haven, 1956), XXIV-XXV].

-56-

- II. Why do most of the planets participate in some way in the motion of the sun? Saturn, Jupiter, and Mars are involved in some way in this motion; for when their longitudinal motion ⁶ and their motion of anomaly ⁷ are added, the sum is equal to the mean motion of the sun ^a. ⁸ In Venus and Mercury, you will find that their longitudinal ^b motion is equal to the mean motion of the sun.
- III. Why does the moon receive its light from the sun and possess no light of its own?
- IV. Why do Saturn, Jupiter, and Mars differ with respect to the length of time of their longitudinal motion and the motion of anomaly, whereas in the sums of these motions they agree?
- V. Why do the longitudinal motions in most of the planets vary? That is, at one time we observe that they are faster, whereas at another time they are slower. ⁹
- VI. Why is the slower longitudinal motion at the apogee in those heavenly bodies, where this phenomenon is found, or in the perigee in those bodies where this is the case? ¹⁰
- VII. Why is it that in most of the planets the period of slower motion in their longitudinal ^c motion is longer than the period of faster motion? ¹¹

¹⁰Ptolemy, *Almagest*, IX:5, 442. See Levi's answer in chap. 9.

¹¹A. Neugebauer, 149.

⁶*Tenu 'at ha-'orekh*. The longitudinal motion of a heavenly body is its variation in angular distance from the vernal equinox, which is the point of intersection of the sun's ecliptic and the equator (Benjamin and Toomer, 41)

⁷*Tenu 'at ha-hilluf*. ἀνωμαλία, "motion of anomaly." Toomer translates it literally as "non-uniform motion" (Ptolemy, *Almagest*,21). As Pedersen notes, this term has a variety of meanings in Ptolemaic astronomy (Pedersen, 139, n.9). Levi uses the term freely to refer to any motion that he thought was non-uniform. However, with respect to the planets, the term "anomaly" connotes their motion on their epicycles. In this particular context, the motion of anomaly is relative to the sun, or synodic anomaly, which produces the apparent retrograde motion of the planets and varies according to the planet's elongation from the sun (Ptolemy, *Almagest*, 21 and IX:5, p.442. O. Neugebauer, *History of Ancient Mathematical Astronomy*, vol. 1, 149. B. Goldstein, *Astronomy of Levi ben Gerson*, chapters 4 and 19).

⁸*Tenu 'at ha-shemesh ha-'emtza'it*. In the medieval context, the mean motion of the sun is its uniform motion on its eccentric orbit, as opposed to its true motion, which varies relative to an observer on earth [Maimonides, *Sanctification of the Moon*, XI:15. I. Efron, "Studies in Pre-Tibbonian Philosophical Terminology," *Jewish Quarterly Review*, 17 (1926), 145].

Gersonides discusses this relationship between the planets and the sun in pt. 1, chap. 18.

⁹B. Goldstein, *The Astronomy of Levi ben Gerson*, chap. 19, lines 13-15.

- VIII. Why is it that in the case of the moon the period of slower motion resulting from the motion of anomaly is longer than the period of quicker motion, whereas in the planets the reverse is the case? ¹²
- IX. Why do the planets that have retrograde motion ¹³ exhibit a greater inclination ¹⁴ ^d at 180° of the motion of anomaly and a lesser inclination at the beginning of the motion of anomaly?
- X. Why do the planets have faster motion at the beginning of anomaly and slower motion at 180° of the motion of anomaly? ¹⁵
- XI. Why is the inclination of the motion of anomaly in Venus and Mercury such that the

beginning of the motion of anomaly is inclined towards the ecliptic in one direction, whereas at 180° of this motion the inclination is in a different direction? This is not the case in Saturn, Jupiter, or Mars, where the inclination of the motion of anomaly is in one direction only.

- XII. Why is it that the planet farthest from the Earth is in some sense the slowest?
- XIII. Why are the planets nearer to the Earth when they are in the place of the greatest anomaly in their motion of anomaly than they are when they are at the beginning and at 180° of the motion of anomaly, as this is apparent by observation in the case of Venus? This is also true in the other planets by virtue of the same necessity as it is in the case of Venus, as is evident from the model that we have demonstrated earlier. ¹⁶
- XIV. Why are some planets closer to the Earth when they are at 180° of the motion of anomaly than when they are at the beginning of the motion of anomaly, as it would appear in the case of Mars, if this is [indeed] the case? ¹⁷

¹²Ptolemy, *Almagest*, IV:5-6,, V:2-3. Pedersen, chap. 6. Neugebauer, 68ff.

¹³*Nezorut*, "retrogradation," or the retrograde motions of the planets. This is the opposite motion of a planet from east to west, contrary to their direct motion eastward. Between the direct and retrograde motions, a planet will appear to be at rest twice for short periods of time. These are its stations ('amidot). (Ptolemy, XII. Pedersen, 329-49).

¹⁴*Neṭiyyah*; literally, "inclination," or "declination." According to Benjamin and Toomer, declination can be generally defined as "any angular measurement perpendicular to the apex of reference." (Benjamin and Toomer, 386.) In this particular context, this measurement refers to the angular distance north or south of a planet from the ecliptic, or its latitude. Levi seems to see a close connection between the latitude and the anomaly of a planet (See answer to question 9 in chap. 9).

¹⁵Goldstein, chap. 19, lines ff. In the vicinity of 180° of anomaly, the planet will have its retrogradations and stations; hence, it will appear to be moving more slowly.

¹⁶Gersonides, *The Wars of the Lord*, Bk. 5, pt. 1, chaps. 17, 36, and 103. Goldstein, chap. 17.

¹⁷Goldstein, chap. 17, 1. 11.

- XV. Why is the moon closer to the Earth at its quadrature [i.e., at halfmoon] than when it is at opposition [i.e., full moon]? ¹⁸
- XVI. Why doesn't the moon exhibit many inclinations, retrograde motion, and stations,ⁱ as do the other heavenly bodies [i.e., planets] which have motion of anomaly? ¹⁹
- XVII. Why is it that in Saturn, Jupiter, and Mars their slowest motion coincides with [the point of the greatest anomaly in the motion of anomaly?
- XVIII. Why is the anomaly resulting from the motion of anomaly much less in Mercury than it is in Venus, although their longitudinal motions are equal?
- XIX. Why is the motion of anomaly in Mercury faster than it is in Venus, although their longitudinal motions are equal?
- XX. Why are the sun and the moon much larger in size relative to their spheres than are the planets [relative to their spheres]?
- XXI. Why do Saturn, Jupiter, and Venus have the limits of their northerly inclinations near the beginnings of Libra and the limits of their southerly inclinations near the beginning of Aries, whereas in Mars and in Mercury the limit of their northerly inclination is near the beginning of Cancer, and the limit of their southerly inclination is near the beginning of Capricorn?
- XXII. Why is the inclination in Mars and in Mercury towards the south more than it is towards the north, but in Venus the reverse is the case, if Ptolemy's account is correct; whereas in Saturn and in Jupiter, the northerly and southerly inclinations are equal? ²⁰

- XXIII. Why is Mercury at perigee ²¹ twice a year, if this is, indeed, the case, as Ptolemy claims?
- XXIV. Why does the duration of the latitudinal motion of the moon differ from the duration of its longitudinal motion, unlike the cases of the planets? ²²
- XXV. Why do the heavenly bodies differ in the magnitude of their slow motions? For example, some of them complete these orbits in about 24,000 years (e.g., the sphere of the fixed stars and Mars); some of them take about 15,700 years (e.g., the sun and Saturn); some take a different time. ²³

¹⁸Ptolemy, V:13-14. Goldstein, chap. 20, 1. 78.

¹⁹Here Gersonides seems to be alluding to the complicated mathematical model Ptolemy constructed to account for the planetary latitudes; this was not necessary for the moon (Ptolemy, IV.9; XIII. Pedersen, 200-02; chap. 12).

²⁰Ptolemy, XIII:1.

²¹Since Ptolemy speaks of Mercury as having two perigees, not two apogees, I have emended



[Ptolemy, *Almagest*, IX:8, Pederson, 314-15.]

²²Ptolemy, IV:2. Pedersen, 161-65.

²³As Levi has already suggested in question 1, the slow motions of the planets differ, and, hence, are not to be identified with the precessional motion of the fixed stars. In this question, the focus is upon the differences amongst the planetary slow motions themselves. On the basis of his own observations, Levi departed from Ptolemy and gave each planetary apogee its own motion (Goldstein, "A New Set of Fourteenth Century Planetary Observation," *Proceedings of the American Philosophical Society*, V. 132, no. 4 (1988), 382-83.

-59-

- XXVI. What is the nature of the shadows observed in the moon and for what purpose are they located in the places that they do occupy in the moon?
- XXVII. What is the nature of the Milky Way that is observed in the sphere of the fixed stars and what is its purpose? For when we shall have known what is knowable to us about this celestial phenomenon, we shall have achieved the knowledgem that was [especially] desired of these phenomena. ²⁴This [investigation] will be continued in the following chapters.

²⁴Aristotle, *Meteorologica*, I:8. Ptolemy, *Almagest*, VIII:2. Gersonides seems to think that knowledge of the Milky Way is particularly desirable. As his answer to this query will indicate, it is a complex question.

-60-

CHAPTER VIII

WE shall lay down several principles that will lead us to the truth on these topics before we actually discuss the explanations of these phenomena. There are six such principles; they are all self-evident or almost self-evident to the reader of this treatise.

First Principle: The heavenly bodies have different actions [péulot]. For example, the sun has an influence ^a upon the generation of heat and tempered [i.e., moderate] dryness, and the moon has an influence upon the generation of cold and moisture. The same is true for other heavenly bodies. ¹

Second Principle: The heavenly bodies have different actions according to their various positions in the ecliptic. This is well-known by observation to anyone who^b investigates these matters. In this way, for example, there are fixed stars that influence the winds or the rain or some other particular natural phenomenon when they are conjoined with some planet. No investigator into these matters has any doubts about this. Similarly, the influence of one planet is completely opposite when it is [at different times] in opposite positions in the ecliptic, even though they [i.e., the points of the ecliptic] do not differ in their inclinations; i.e., they have the same proportion of altitude to the horizon. This indeed happens when one place is in the beginning of Aries and the other place is in the beginning of Libra. Indeed, this difference [in influence] derives from the difference in the natures of the rays of the stars which are in these locations.²

Third Principle: To the extent that a planet prolongs its stay in a particular Zodiacal position, the action from it becomes stronger because of the nature of the rays of the stars with which it is conjoined. This principle is also self-evident to the reader of this treatise. For the ratio of action to action is proportionate to time; e.g., a fire produces more heat in the thing heated by it in two hours than in one hour, as has been pointed out in the *Physics*.³

Fourth Principle: A heavenly body has different actions according to its inclination, northern or southern. e.g., to the extent that its altitude as it crosses over the mid-heaven⁴ is greater, so is its influence stronger. This

¹Ptolemy, *Tetrabiblos*, 1:2 and 4.

²Ibid., 1:17.

³Aristotle, *Physics*, VII: 4-5.

⁴Ptolemy, *op. cit.*, 1:6.

is clearly seen in the case of the sun, for its heating is much greater when it is at the beginning of Cancer than when it is at the beginning of Capricorn. By parity of reasoning, we can infer that the same is true for the other heavenly bodies.

Fifth Principle: To the extent that the ray [of a heavenly body] is greater,⁵ the influence deriving from that body is stronger. For, since the influence of the heavenly body comes via its ray, it follows that the greater the ray the stronger the influence coming from the heavenly body.

Sixth Principle: The closer the heavenly body is to the earth the stronger is its action, since the ratio of the [stellar disc of that body] to the orbit on which it rotates is greater. Therefore, the ray [or illumination] coming from the heavenly body to the Earth is greater [in strength].⁶

⁵The term *gidul* connotes here "intensity."

⁶In Bk, 5, pt. 2, chaps. 7 and 9 (question 20) and in chap. 8 of pt. 3, Levi will be concerned with explaining the varying influences of the planets upon the Earth. In Principle 5 of this chapter, Levi stipulates that these influences are primarily a function of the radiation of the heavenly body. The present principle states that the closer a celestial body is to the Earth, the greater is its radiation or influence. He tries to explain this principle in terms of the ratio (*yaḥas*) between the apparent size of a planet, or the stellar disc, and the orb, or sphere, on which it rotates. When the latter decreases, the former increases: when the sphere gets closer to the Earth, its orbit around the Earth decreases; hence, the apparent size of the planet itself, or the planetary disc, will appear larger relative to the orb. The increase in the apparent size of

the planetary disc relative to its orbit means that the radiation emitted by the planet "fills up" the orb to a greater extent. Thus, the influence of the whole planetary sphere will be greater (T.Langermann, "The Astrology of Levi ben Gerson", Appendix, volume 3, infra).

-62-

CHAPTER IX

ONCE we have understood these principles, which are almost selfevident to the reader of this treatise, we will not find it difficult to explain all those problems that we have set out to investigate [in Chapter VII].

I. The reason why all the heavenly bodies participate in both the diurnal and slow motions is as follows. Since the times of the duration and generation of generated and corruptible things are determined by the four seasons [i.e., the periods bounded by the equinoxes and solstices] which are [themselves] generated by the heavenly bodies (as has been pointed out in the sciences), and since some of these things have longer periods of duration than others, and it is necessary that all the heavenly bodies be involved in the preservation of these various natural phenomena, it is necessary that all the heavenly bodies participate in the short and long seasons to some degree. Now, the things that enjoy a longer period of duration by virtue of this extraordinary process are those things whose generation and corruption take place only over very long intervals of time, such as mountains, oceans, large nations,^c and other large-scale things of this sort. ¹In this process, all the heavenly bodies participate, albeit differently, in the slow motion. ²The reason for the participation of the motions of the apogees and of the motion of the ascending nodes in these movements is that some diversity amongst the planets comes about as the result of the slow motion; in addition,^d their relationships [i.e., aspects, or angles], according to which they have been arranged, with the fixed stars vis-a-vis their inclinations will be preserved. For, in the [latter] case, the nature that they receive from the rays of the stars is preserved. For example, by virtue of this [motion], the latitude of Mars with respect to the Zodiac is always the same when it is in Regulus [lev aryeh], whenever it is in motion of anomaly in [any] one place. Diversity occurs in Mars because of the slow motion, so that when it is in that place [i.e., Regulus] it is always farther away from the northern limit [or the greatest northerly inclination]; i.e., it is always farthest away from the summer solstice, until Regulus reaches the winter solstice. At that point, Mars

¹*Ha-devarim ha-kollelim*. This term seems to correspond to the phrase used by Ptolemy, ὁ καλεῖται καθολικόν, to refer to such things as whole races, countries, and cities. (Ptolemy, *Tetrabiblos*, trans. F.E. Robbins (Cambridge, MA., 1940), II:1.)

²Thus, the slow motion is responsible for the longer periods, whereas the diurnal, or fastest motion is responsible for the shorter periods of duration.

-63-

then begins to approach^e the northern direction until Regulus reaches the summer solstice. In this manner, the influence of Mars when it is in Regulus varies continually, for to the extent that a planet in Regulus^f is nearer to the summer solstice, its influence is greater, as has been explained in the third of the principles previously mentioned. ³To the extent that it approaches, while in Regulus,^g the winter solstice, its influence is weaker. This is a cyclical process, and the cycle is completed when the slow motion has been completed. Indeed, this is the case with Mars [because] its slow motion is equal to the motion of the sphere of the fixed stars. In the other planets, where the slow motion is different from the motion of the sphere of the fixed stars, there

is also [some] diversity because of the motion of the apogee. For example, when Saturn is in Regulus at apogee, its influence is weaker because of [its] distance. Its influence increases when it is in Regulus when it is at the perigee, for then it is closer to us.^h The influence of Saturn while in Regulus in apogee differs in another respect from the influence when it is in perigee while in Regulus by virtue of the quickness and slowness of its motions; from these different proportions [of velocity] are generated many sorts of diverse influences. The variation in these proportions proceeds cyclically, and the duration of this cycle is completed when the slow motion is completed.

The moon, too, exhibits different proportions [in velocity] resulting from the slow motion. Although its motion of the ascending node and the motion of the apogee are not measured in terms of the slow motion because of its involvement with the sun at the times of the new moon and of opposition -- from which it acquires an influence and nature that are exhibited in the phases of the lunar month -- [nevertheless], since the sun exhibits variation with respect to any given star in the ecliptic (as we have previously indicated), a [corresponding] variation accrues to the moon from this fact.⁴ This variation is cyclical; and the cycle is completed with the completion of the slow motion. We then have completed our explanation (in terms of the principles at our disposal) of the participation of all the heavenly bodies in the diurnal and slow motions and of the motions of apogee and ascending nodes in these motions.

II. The participation of most of the planets in the solar movements to some extent has as its cause too that all of them participate to some extent in the four solar seasons, for they [i.e., these seasons] have a strong influ-

³Gersonides, *The Wars of the Lord*, Bk. 5, pt. 2, chap. 8. In his answer to question 1, Levi is clearly referring to the precession of the equinoxes, specifically to the motion of Regulus, a bright star in the constellation Leo, which lies nearly on the ecliptic. He then selects Mars to illustrate the varying relationship between a planet and a star in terms of the latter's proximity to the summer solstice.

⁴Precession affects the moon indirectly because of the moon's relation to the sun. But this is enough to produce the desired variation.

ence upon natural phenomena, such as plants and animals. This participation is evident in Venus and Mercury. However, in Saturn, Jupiter, and Mars, the participation results from the fact that the sums of their longitudinal motions and their motions of anomaly equalsⁱ the mean motion of the sun. Nevertheless, the solar seasons deriving from them differ. In the case of Saturn, these four periods resulting from the motion of anomaly are completed in about one solar year and thirteen days. For when Saturn is in the beginning of the motion of anomaly, it is with [i.e., in conjunction] the sun; when it is at 90° of the motion of anomaly, it is in quadrature^j with the sun, according to the mean motion; when it is at 180° of the motion of anomaly, it is in opposition with the sun, according to the mean motion; and when it is at 270° of the motion of anomaly, it is again at quadrature with the sun, according to the mean motion. In this manner, the four seasons [determined] by Saturn are generated in^k about 378 days and 2 hours. With respect to Jupiter, however, the four periods are generated in about one solar year, 32^l days and 15 hours. In Mars, the four periods are generated in about 2 solar years, 48 days and 11 hours. And in these periods, there is a participation of planets in the [motion] of the sun, so that they participate with it from this aspect in its periods, according to their relationships with it.

Now, the times of the motions, from which are generated the solar seasons in these different planets, [are such] that in this manner terrestrial phenomena will be perfected; i.e., their periods are measured by the seasons of these planets. For, as the sciences teach us, it seems that the periods of sub-lunar phenomena are measured by the periods of the various heavenly bodies. Nature preserves an equilibrium in this process: it makes the longitudinal motion slower when the motions of anomaly are faster in these three planets [i.e., Mars, Saturn, and Jupiter]. In this manner, those things whose seasons are measured by the periods of the longitudinal motion of Saturn,^m for example, have a longer duration than those things whose seasons are measured by the periods of Jupiter. The same is true when Mars is compared with Jupiter. But with respect to the periods [determined] by the motion of anomaly, the situation is just the opposite, and it is in this sense that we have said that nature preserves here an equilibrium. Moreover, if this were not the case, the planets would not be able to participate in the periods of the sun in the manner we have described. For it is required that the motions [of longitude and of anomaly] be equal to the mean motion of the sun. Therefore, whichever [planet] has a slower longitudinal motion, its motion of anomaly is faster. The reason why the motions of these planets differ is the perfection of terrestrial phenomena, [especially] in the cases of generation, whose periods are necessarily measured by different times by virtue of the dif-

-65-

ferences in length of [their] duration [i.e., their respective life-spans].⁵

In Venus and Mercury, however, the longitudinal motion is equal to the mean motion of the sun, and they are always with the sun in their mean motions, so that their rays are always mixed with the rays of the sun in such a manner that natural phenomena are benefited. However, in their motion of anomaly, four additional periods are generated because of the differences in their [respective] velocities and in the amount of inclination. For [these differences] are what account for the contrary natures of the periods deriving from them, as has been explained [in Book V, Part 2, Chapter VIII] on the fundamental principles.

III. Now, the moon, because of its participation with the sun in so far as it receives its lightⁿ from the sun, possesses periods that participate in some way in the periods of the sun. For when the moon is at an [angular] distance of 90° from the sun, the eastern part of the moon emits light; when it is at an [angle] of 180° from the sun, all of the moon emits light; and when it is at 270° distance from the sun, the western part of the moon emits light. In this manner, the four phases of the moon are generated by virtue of its distance from and proximity to the sun. For this reason, the moon has no light of its own, but it receives its light from the sun.

The moon exhibits another kind of participation with the solar periods by virtue of its consecutive **conjunction** with the sun throughout the twelve constellations of the Zodiac during one year -- i.e., the first mean **conjunction** [ha-molad] is in the constellation of Aries, the second in Taurus, and so it continues (or nearly so) every month. Accordingly, since it is evident to anyone who is familiar with astrology that the moon acquires from the position it occupies at the time of its mean **conjunction** a nature that continues almost throughout the lunar [i.e., synodic] month [i.e., from **conjunction** to **conjunction**], the moon participates in this way with the sun in the solar periods. It has now been shown that all the planets [including the moon] participate in some way in the sun in its seasons. And we have demonstrated as best we can the reason for this.

IV. [The answer to question IV has been included in the answer to question II.]

V-VII. The reason why the longitudinal motion in most of the planets differs, such that at one time it is faster and at another time slower, is as follows. [These changes occur] so that many

proportions [of velocity] will be generated from this motion by virtue of the quickness and slowness in motion, such that in this manner the multiplicity of generation in the sub-lunar world will be achieved, as has been explained in the second principle previously discussed. ⁶For the same reason, a planet is at one

⁵Aristotle, *On Generation and Corruption*, 11:10, 336b 11-15; *Generation of Animals*, IV:10, 777b, 17, ff.

⁶Gersonides, Bk. 5, pt. 2, chap. 8.

-66-

time in apogee but at another time in perigee in order that many relations of distance and proximity of a planet be generated, from which result many influences, as has been explained in the fifth principle. Now, the slower motion in these planets lasts longer than the quicker motion to equalize their four periods. For, since the slowness results from the [motion at] apogee and, consequently, the influence deriving from it is weak because of the distance, nature cunningly has placed the slower motion at apogee and made it last longer than its faster velocity to equalize the four periods, so that the terrestrial phenomena which receive their activities will be benefited.

VIII. This reason accounts for the fact that the period of slower motion of the moon resulting from the motion of anomaly is longer than the period of faster motion. It seems that the moon is farther from us at the beginning of the motion of anomaly than it is at 180° of the motion of anomaly, but we ourselves have not yet verified this by observation. However, if the slower motion were at perigee, as it seems to be in the case of Mars (as we mentioned at the end of Part 1 of this Book), or if the place of the slower motion were no farther from us than the place of the faster motion, this would be so because of the greater needs of terrestrial phenomena for the influence of the periods generated by this heavenly body [i.e., the moon] when its motion is slower than their need for the influence of the periods generated by its faster motion.

There are then two or three reasons that combine [to account] for the strength of the influence of these periods. First, the slowness of motion, for this increases the influence of the heavenly body. Second, the length of time of these periods, for this, too, increases the strength of the influence of the heavenly body in those periods that last longer. Third, the proximity of the heavenly body to the Earth during these periods. This takes place, however, in those heavenly bodies that exhibit this phenomenon, i.e., they are in fact closer to the Earth when they are at the place of slower motion.

IX-X. Concerning the planets that have retrograde motion, the reasons why they have greater inclination at 180° of the motion of anomaly than at the beginning and why they have faster motion at the beginning of the motion of anomaly and slower motion at 180° are as follows. In Saturn, Jupiter, and Mars, this is so because ° at the beginning of the motion of anomaly, they^p are at the same place in the ecliptic as is the sun; there is then a kind of "agreement"⁷ amongst them by virtue of the nature that their rays receive together from the fixed stars with which [they are

⁷*Haskamah*. This term seems to have a special meaning or role in astrology. Sextus Empiricus uses the phrase συμφωσεν ἀλλήλις [Sextus Empiricus, (*Adversus Mathematicos V:39*)].

-67-

conjoined]. When they are at 180° of the motion of anomaly, they are opposite the sun; there is then a contrast between them [and the sun] by virtue of the nature that they [severally] receive from the fixed stars, since they are in a constellation opposite the sun. And since the rays of the sun are strong because of its size, nature cunningly has made these planets less powerful when they are in "agreement" with the sun by [endowing them with] a faster velocity and a smaller inclination [than] is possible for them to have in that part of the inhabitable region of the earth [i.e., in the north] when the sun is in the northern constellations and in the south when the sun is in the southern constellations. For the sun requires only small assistance [from the planets] because of the strength of its rays. When the influence of the planets is contrary to that of the sun, nature gives them a stronger influence by virtue of their slower velocity in that place, so that they move backward and then return to that very same place a second time. As a result of this, the duration ^q of their presence in that place in the ecliptic is lengthened. And this is so for two reasons: (1) slowness of motion; and (2) their return to that region for a second time. There ^r is also a third factor that increases the strength of the influence at this time: the amount of inclination that is possible for them to have in the place where from this inclination there is a contrast with the sun; i.e., in the southern region when the sun is in the northern constellations and in the northern region when the sun is in the southern constellations. For ^s in this manner, ^t they have an even greater contrast with the sun. Although this inclination occasionally occurs in the opposite manner, it does occur to increase the [various] relationships [amongst the planets and the sun] so that many influences are in this way ^u perfected.

In Venus and Mercury, there is also an "agreement" with the sun when they are in the beginning of the motion of anomaly, in so far as they are in the same region [of the ecliptic] with the sun and have only a small inclination. However, when they are at 180° of the motion of anomaly, there is some contrast with the sun by virtue of their great amount of inclination. Thus, they also have quicker motion at the beginning of the motion of anomaly and slower motion at 180° of this motion for ^v the very same reason that this is true for Saturn, Jupiter, and Mars. Although this inclination is sometimes slight at 180° and sometimes they have no inclination at all (as has been mentioned earlier), this is to bring about many relationships so that the many required influences for the perfection of the sub-lunar domain thereby are perfected. The same is true in the case

-68-

of the inclination in Saturn, Jupiter, and Mars when they are at 180° of the motion of anomaly: sometimes the inclination is slight; sometimes there is no inclination at all, as has been mentioned before. Finally, there is another reason for this situation ^w in Venus and Mercury. It is in this way that it is possible for four mutually different periods to be generated from them by virtue of the motion of anomaly.

XI. For the [above reason] too, therefore, the inclinations of Venus and Mercury are at the beginning of the motion of anomaly in one direction but in another direction at 180° , which is not the case in Saturn, Jupiter, and Mars. For, if the velocities and inclinations [in Venus and Mercury] were the same at 180° of the motion of anomaly as they are at the beginning of this motion, there would be no difference at all in this motion between the beginning of their motion of anomaly and at 180° of their motion of anomaly! And since the preservation of equilibrium between contraries results from the four periods that are generated by various motions, as has been mentioned in scientific treatises, it is necessary that there be a difference between [the velocity or inclination] of a planet at the beginning of the motion of anomaly and [the velocity or inclination] at 180° .

The view of the ancients that when the planets have retrograde motion they have no influence is without any foundation. ⁸For, [to the contrary], at that time their velocity is slower; thus, their

influence is necessarily greater, as we have explained. On the other hand, [in their behalf it could be said] that observation does suggest this view, for they did observe that the influence emanating to the Earth ^x from these planets when they were in retrograde motion was quite feeble. This is the case, however, because the sun exerts at that time an influence contrary to their influence, since the sun is in the opposite region in the Zodiac. Accordingly, since the sun overpowers them by virtue of its intense illumination, their own influence at that time is weak. But this weakness is not attributable to them, for it is appropriate for them to have a greater influence [by virtue of their slower velocity]. This weakness derives, however, from the countervailing influence of the sun in that region. Moreover, Venus and Mercury also exhibit some contrariety to the sun at that time.

XII. The reason why the farthest planet from the earth [i.e., Saturn] has the slowest motion of all the planets is so that its influence upon Earth be appropriate for the perfection of terrestrial phenomena. Since the influence of the planet farthest ^y from the Earth is the weakest, nature was

⁸Ptolemy refers to the weak influence of the planets in their retrograde motion in his *Tetrabiblos* 111:3 [cf. Abraham ibn Ezra, *The Beginning of Wisdom*, trans. R. Levy (Baltimore, 1939), 203.].

cunning when it gave to Saturn a slower motion to compensate for the weakness of its power because of its distance from the Earth.

XIII. For this very reason, the planets are nearer to the Earth when they are at the [place] of greatest anomaly in the motion of anomaly than they are at the beginning or at 180° of this motion, as can be observed in the case of Venus. For then they are in contrast to the sun, either because they are then in quadrature with the sun, as in the case of Saturn, Jupiter, and Mars, or because they are then at the greatest distance from the sun, as in the case of Venus and Mercury. In these circumstances there is the least possible agreement with the sun because of their different positions in the ecliptic, [resulting in] the greatest possible anomaly for them. Therefore,^z they are closer to the Earth when they are at this place. However, when they are at 180° of the motion of anomaly, they do not need to be close to the Earth to strengthen their influence, for their ^{a1} great inclination and slower velocity in this place are sufficient, as has been mentioned.

XIV. ⁹On the other hand, if Mars is [really] closer to the Earth at 180° of the motion of anomaly [than when it is at the beginning of its motion of anomaly], as we are inclined to believe, this would be for the purpose of strengthening its influence when it is in opposition to the sun, so that terrestrial phenomena would be benefited. For by virtue of its quick motion together with its being at 180° of the motion of anomaly, its influence is not sufficiently strong for the needs of the sub-lunar world. Thus, it has been placed close to the Earth at this time [i.e., at 180° of the motion of anomaly], if this is, indeed, the case.

Herein lies the explanation why the ^{b1} greatest anomaly exhibited in the motion of anomaly occurs when the planet is more than 90° in the motion of anomaly [directly] proportionate to the amount of greatest anomaly, as is apparent from what has been observed of Mars, Venus, and Mercury, according to Ptolemy's account of the observations of Mercury with respect to its greatest distance from the sun. For in this manner, it is possible for Saturn, Jupiter, and Mars, when at quadrature with the sun [and] when at greatest anomaly, to be closer to the Earth. Nature has intended this for the purpose previously mentioned. In Venus and Mercury, on the other

hand, this [arrangement] equalizes the influence of the four periods which these planets have by virtue of the motion of anomaly. For, since the influence of these planets is weak because their motion is fast, the period of faster motion has been made longer in order

⁹Unlike his enumeration of questions in Chapter 7, where Gersonides provides explicit numerical sequence, the ordering of the answers in this chapter is not explicitly numerated by Gersonides. Nor is the ordering strict. This is most glaring here: Gersonides gives his answer to question 14 after his answers to questions 15 and 16. To preserve the original order of questions given in chapter 7, I have placed the answer to question 14 before the answers to questions 15 and 16. The enumeration of answers in the chapter is mine.

-70-

to compensate for this [weak influence]. This explanation is also valid for Saturn, Jupiter, and Mars.

XV-XVI. It should be realized that this same reason, which is operative in the cases of Saturn, Jupiter, and Mars, also explains why the moon is closer to the Earth in its quarterly aspects than at other times of the month: by virtue of this feature its influence is greater at this time. At opposition, however, [proximity to the Earth] is not required, since then its light is full. The abundance of light at that time [i.e., at full-moon] is sufficient to provide for the strength of its influence, since at that time the illumination is double the amount than when the moon is at quadrature. Therefore, the moon does not require additional inclination when it is opposite the sun nor slower motion in order to strengthen its influence; for the latter purpose, the abundance of light deriving from its opposition to the sun is sufficient, as has just been mentioned. For this reason, the moon does not exhibit retrograde motion at all and has only one inclination.

XVII. The reason why Saturn, Jupiter, and Mars have their slowest motion when their anomaly is the greatest is as follows. This is the case so that the retrograde motion that each of these planets requires when in opposition to the sun is completed, in such a way that an influence contrary to that of the sun results when it is sufficiently strong to benefit terrestrial phenomena.

[XVIII is answered at the end of II.]

[XIX is answered in XXII (end).]

XX. The reason why the sun and the moon are larger [in size] relative to their spheres than the planets [are to their spheres] is, in my opinion, as follows. Since the preservation of natural phenomena is a function of their inherent natural heat and moisture, and since it is most appropriate for the sun to give the natural heat to these things and the moon to give moisture (as is obvious), it is necessary that these heavenly bodies be larger [relative to their spheres] so that their influence will be greater than the influence of the planets, whose influence is contrary to that of the sun and to that of the moon. For this very reason, Jupiter and Venus are larger relative to their spheres than Saturn, Mars, and Mercury; [i.e.,] Jupiter has some effect upon heat and moisture, and Venus has some effect upon cold and moisture, as is well-known. On the other hand, Saturn, Mars, and Mercury all have some effect upon dryness, as is well-known to anyone familiar with astrology. ¹⁰

XXI. Why the northern limit of inclination in Saturn, Jupiter, and Venus ¹¹ is approximately ^{c1} at the zenith of Libra while the limit of their southern inclination is approximately at the beginning of Aries, and why the limit of northern inclination in Mars and Mercury is approximately at

¹⁰Ptolemy, *Tetrabiblos*, I:4. Gersonides, *The Wars*, Bk. 5, pt. 2, chap. 8, sixth principle.

¹¹The planet Venus is omitted here but is included in the original question in chap. 7.

-71-

the beginning of Cancer while the limit of their southern inclination is approximately at the beginning of Capricorn -- is, in my opinion, as follows. Nature has given them this arrangement so that they receive the appropriate illumination from the fixed stars, such that their influence upon the sub-lunar domain is as perfect as possible. The nature of the illumination that they [severally] receive from the stars differs according to their differences in inclination with respect to amount and direction. Moreover, it is possible also [that such an arrangement exists] in order that there frequently should be some latitude between these stars and Mars and Mercury when they meet together. Thus, the limit of inclination in the one is near the place of the beginning of the inclination in the other.

XXII. The reason why in Mars and Mercury the inclination is more to the south than to the north, but in Venus the reverse is the case (if Ptolemy is right), whereas in Saturn and Jupiter the southern and northern inclinations are equal, is as follows. Terrestrial phenomena have a greater need for the influence of Mars and Mercury when these planets are farther from the northern region, i.e., the inhabitable part of the Earth, than they have when these planets are closer to this region. [Accordingly], they have been endowed with more of a southern inclination. Moreover, Mars is the closest [to the Earth] when ^{d1} it has a northern inclination, whereas it is farthest away when it has a southern inclination. Thus, it is appropriate that the southern latitude be greater, so that the proper contrast between its solar periods be achieved. It would seem that nature has intended the dominance ¹²of this planet [i.e., Mars], although the need of sub-lunar phenomena for its distance from the northern [i.e., inhabited] region is greater than their need for its proximity. And since the need of terrestrial phenomena for the influence of Venus is greater when Venus is closer to the northern region than it is when Venus is distant from this part of the Earth, the northern inclination of Venus has been made greater. ¹³[Finally], since the need of terrestrial phenomena for the influence of Saturn and Jupiter when they are distant is the same as their need for this influence ^{e1} when these planets are near, the inclinations of these planets are equal in direction. For this reason the distance of Mercury from the sun is much less than the distance of Venus from the sun; i.e., terrestrial phenomena require a stronger influence from Venus than they do from Mercury, since to the extent that when a planet is farther from the sun, its special influence is stronger because of its smaller

¹²*Tigboret*, "dominance". In the traditional astrological scheme the influence of Mars by itself was considered to be maleficent (Ptolemy, *Tetrabiblos*, I:5 and II:8). Together with certain other heavenly bodies, however, it could have a beneficent influence. The Hebrew term "tigboret" corresponds to Ptolemy's term *δικοδεσποτία* (Ibid., II:7).

¹³Venus was believed to have a beneficent influence (Ibid., II:18).

-72-

mixture at that point with the rays of the sun. And for this reason, too, the motion of anomaly in Venus is slower than it is in Mercury, since terrestrial things need a stronger influence from Venus than they do from Mercury, for the slower the motion, the greater the influence that comes from the planet to the Earth, as has been explained. ¹⁴

XXIII. The reason why Mercury is at perigee ¹⁵ twice a year, if this is in fact true as Ptolemy claims, is as follows. By virtue of this [kind of] motion, the four periods are completed in one half of a solar year, so that the periods of terrestrial phenomena will be determined [i.e., measured] by the former [in such a way] that the latter periods are in harmony with the former, according to what was given to their natures [by the original plan of the universe] with respect to length of their life-span and their preservation. ¹⁶

XXIV. For this reason, the latitudinal motion of the moon differs from its longitudinal motion: ¹⁷ for in this way, four periods are generated from the latitudinal motion, and some of the periods of sub-lunar phenomena are measured according to the periods of the moon. As a result of this, many kinds of periods are generated from the moon. First, from the monthly motion, four phases are completed during the lunar month. Second, because of the [angular] distance [of the moon] from the sun, the light of the moon varies in quantity. Third, since the longitudinal motion is completed in approximately 27 days, 7 hours, and 43 minutes, [another set of periods results]. Fourth, [a different set of periods results] from the motion of anomaly, which is completed in 27 days, 13 hours, and 18 minutes. Fifth, ¹⁸ because of the latitudinal motion, which is completed in approximately 18 solar years and 204 days [another set of periods results]. Now from each one of these [kinds of] motions four periods result besides the diurnal periods and the periods resulting from the slow motion of the moon, as has been explained before. ¹⁸ By means of these four [types of] periods [the periods] of some terrestrial phenomena are measured to some degree.

XXV. [No explicit reference to or discussion of question XXV is given in Chapter IX, but since questions I and XXV are related in subject-matter, perhaps Levi's answer to question I includes an answer, at least in part, to question XXV.]

XXVI. Why is the shadow in the moon in the place that it is, and what

¹⁴This last point is the answer to question 19.

¹⁵According to my emendation in question 23 in chap. 7, I read here:



Ptolemy, *Almagest*, IX:8.

¹⁶Ptolemy, *Tetrabiblos*, I:2.

¹⁷Ptolemy, *Almagest*, IV:2.

¹⁸In the reply to question 1.

is its nature? ¹⁹ Now it seems that there is something in the body of the moon that does not receive light from the sun in the way that the other parts of the moon do. One cannot say that [this shadow results] from a vapor under the moon that has the property of continually hiding part of the moon from us. If this were true, it [i.e., the shadow] would not be localized in one place all the time, nor even in one geographical region; ²⁰ rather, it would be observed at different places. For example, this shadow would be observed in one part of the moon when the moon ascends on the horizon and at another part when the moon sets, since the lunar parallax varies in those different places. But this phenomenon is not seen in this shadow. Moreover, if this explanation were accepted, what accounts for the uniform motion of this vapor, such that its motion has all the variations of motion in latitude and in longitude of the moon? Indeed, it would require the same number of spheres to move it as does the moon [require for its motion]. But this is utterly absurd. If we should say, [alternatively], that the very nature of the moon continually generates this vapor in the air under it, the same difficulty ²¹ with respect to differences in observation would ensue. Moreover, if this [hypothesis] were accepted, this shadow should be

circular; for the parts of the moon are uniform in substance, and thus in giving rise to this vapor, which is *ex hypothesi* continuously under it, these parts obviously should have the same influence in generating it. [But since the shadow isnaaaa't circular, the hypothesis of the vapor is false.] ²¹

Nor is it possible to say that this shadow is only an apparition [re'iyal, and not a real thing, similar to the rainbow or to a hajo ^{h1}. If this were the case, it would have to be circular, since it lies on a straight line between the illuminating body and our vision. This has been proven in mathematics. Moreover, on this hypothesis, this ⁱⁱ shadow should disappear when the air is clear and increase when the air is thicker. [But, in fact, this does not happen!] Now, since it has been shown that this shadow is not something under the moon [i.e., a vapor] nor an apparition, there is no alternative but to say that it is in the body of the moon itself, as we

¹⁹Gersonides seems to referring here to the *miaria*, or "lakes" of the moon.

²⁰*Aqlim*, κλιμα. Although we get our term "climate" from this Greek term, the Greek term connotes a geographical region between two terrestrial latitudes, where the same phenomena (e.g., length of longest daylight) are generally found. In Greek geography the inhabited part of the earth was divided into seven such regions (Ptolemy, *Almagest*, Introduction, 19. Neugebauer, I, 334 ff and II, 727 ff).

²¹In the notes to their translation of Plutarch's essay, "Concerning the Face which appears in the Orb of the Moon," H. Cherniss and W. Hombold remark that the hypothesis of the sub-lunar vapor was advanced by Simplicius and refuted by the Arab scientist AlHaitham (965-1039), whose own theory is similar to the one that will be proposed by Gersonides (Plutarch, *Moralia*, vol. 12 Loeb Classical Library, 19-20, note a).

have originally suggested.

Now,^{j1} this is so, we believe, for either or for both of the following two reasons. First, [in this manner], we can explain the differences amongst the four phases that are generated by the moon by virtue of its receiving light from the sun throughout the synodic month. For in the first ^{k1} quarter, [the sun) illumines the eastern part of the moon, and in this part, only a little shadow is found. In the final quarter, [the sun] illumines the westem part, in which almost all of the shadow, except for a small portion, is present; [thus], the light that is emitted from the moon [in the final quarter] is less than [what is emitted] in the first quarter. In this manner, the first quarter differs in the quantity of moon-light [emitted] from the fourth ^{ll} quarter, and analogously, the second quarter differs from the third. And since a heavenly body influences terrestrial phenomena by means of its rays -- and the greater the illumination, the greater the influence -- it is evident that different influences are derived from the moon throughout its four phases. ²²

Second, since the moon controls and moves the element of water, and since it is necessary that this element not encompass the entire earth in order that the inhabitable portion of the earth and its denizens not be destroyed, nature ^{m1} was especially cunning in making one part of the moon not receptive of light, i.e., its northern part, so as to make sure that this part, the inhabitable part, of the earth is preserved. For this reason, the shadow is great in the northern part of the moon.

XXVII. The Milky Way, its nature and purpose. It seems that it is something in the sphere of the fixed stars similar in nature to the moon. That is, it receives light from the sun, as does the moon, or perhaps it receives light from the sun and, [in addition], from the other stars but receives this

light feebly, such ⁿ¹ that its illumination on the Earth is not perceptible. [Nevertheless], it does have some influence upon the sublunar domain; hence it is one of the great circles. ²³

In his commentary on the *Meteorologica*, Averroes has pointed out that the Milky Way is not something in the air below the fixed stars. For if this were true, there would be different observational results with respect to the positions of the Milky Way relative to the sphere of the fixed stars in different geographical zones. But this is, in fact, not the case! [Indeed,] if this hypothesis were correct, it would also be the case that the positions of the Milky Way relative to the sphere of the fixed stars would vary because of the parallax, even in the same geographical zone when the

²²Ptolemy, *Tetrabiblos 1*: 4 and 8.

²³According to Aristotle, the Milky Way describes a "great circle", i.e., a circle on the surface of the sphere whose center is also the center of the sphere (Aristotle, *Meteorologica*, I:8, 345a 33 See the notes of H.D. Lee in his edition of the text in the Loeb Classical Library).

-75-

observation of the stars is, for example, made in the eastern horizon and in the western horizon. This point is familiar to those who have examined our discussion of the amount of parallax of the Moon. ²⁴ Nor is the Milky Way some kind of optical apparition, for there is no eternal mirror ^{o1} by virtue of which the reflection, which would give rise to this apparition, could be produced. Accordingly, Averroes concludes ^{p1} that the answer must be one of the following three hypotheses:

(1) Either it is an apparition without a mirror producing the reflection ^{q1} and the cause of this reflection ^{r1} is weakness of vision, for, according to Averroes, reflection results from weakness of vision, as in the case of [the reflection] resulting from an intervening thick body. And the cause of the weakness of vision which occurs in this place is that there are very fine stars in this region, ^{s1} which cannot be seen because of their smallness. The circles of the reflection ^{t1} intermingle, and they are perceived in this figure [i.e., the Milky Way] by virtue of the proximity of those ^{u1} stars to each other. (2) Or, that part of the sphere [of the fixed stars] is thicker than the other parts, and it receives light from the stars in that region in the way that the moon receives light from the sun. (3) Or, in this place, there are very ^{v1} small stars closely bunched together, such that their [individual] bodies are not perceived [but] their light is seen by virtue of its strength resulting from the intermingling [of their individual rays]. And from this, it happens that this light is seen, for Averroes believed that when the visible object becomes small in size and distant, its light is [still] seen, but not its figure. He assumed this because it is self-evident. ²⁵

Our view is as follows. If the cause of this phenomenon, [i.e., the Milky Way] were weakness of vision [as the first hypothesis suggests], it would be greater to those who are poorer in vision than it is to those who have good sight. Nor would this phenomenon be perceived uniformly by all men. But this is not the case. Rather, the weak-sighted don't see this phenomenon ^{w1} at all! Moreover, weakness in vision would occur, causing this reflection, ^{x1} when the eye is diseased, either because of the presence

²⁴Gersonides, *The Wars of the Lord*, Bk. 5, pt. 1, chaps. 73-74.

²⁵In his commentary on Aristotle's *Meteorologica*, Averroes uncharacteristically departs from his master and rejects Aristotle's view that the Milky Way is a sub-celestial phenomenon. According to Aristotle, the Milky Way is a mixture of fire and air produced by the motion of

the sphere of the fixed stars in the uppermost region of the air (Aristotle, *Opera Cum Averrois Commentarii*, vol. 4, 412 K-M). Instead, Averroes proposes three plausible alternative hypotheses, of which the second and third explain the Milky Way as a phenomenon in the sphere of the fixed stars. The third hypothesis according to which the Milky Way is a collection of small stars densely packed together was, according to some ancient sources, the view of Democritus, the great Greek atomist. It is mentioned without attribution by Saadia Gaon in his *Book of Beliefs and Opinions*, Introduction, 23-24. Something like this view turned out to be the correct hypothesis, as Galileo was to prove observationally with his telescope [Galileo, *The Starry Messenger*, translated by Stillman Drake and included in his *Discoveries and Opinions of Galileo*, (New York, 1957), 49. Dreyer, *A History of Astronomy*, 29 and 121).

-76-

of water or some [kind] of thick mist [in the eye], as Aristotle points out, but in a healthy eye,²⁶ this would not occur. ²⁶ Furthermore, if this hypothesis were admitted, it would be quite puzzling why this phenomenon occurs throughout this part of the sphere [of the fixed stars] continuously; i.e., why these small stars are continuously present throughout this region so that this apparition results. And why does this phenomenon occur in a part of the sphere [such that] a great circle is described? This difficulty is [also] pertinent to the third of the explanations suggested by Averroes. ²⁷

That this phenomenon can be explained in terms of Averroes' second hypothesis in the way we have originally stated it is impossible. ²⁸ For his theory ²⁹ that that part of the sphere receives light from the stars therein because of its thickness is not correct. If this were true, it would be more appropriate for it to receive the sun-light, since it is [*ex-hypothesi*] the nature of that part of the sphere to receive light. The moon, [for example] receives light from the sun only, and not from the stars, for if it did receive light from some other body, that part of the moon not facing the sun would sometimes emit light. But this is not so. Accordingly, we maintain that this part of the sphere receives sun-light, and perhaps it receives light from the other heavenly bodies as well. The utility of this phenomenon is that a part of it is always on the horizon, and [thus], some influence upon the Earth emanates [from it] when it is not possible for the [other] heavenly bodies to exert their influence upon that place. For this reason, it must be one of the great circles in order for its activity to extend throughout all parts of the Earth, as is the case with the planets, which move in great circles, or nearly so, as has been explained. ³⁰

We have now completed, as best we can, our explanation of the heavenly phenomena that we have set out to investigate. May God be greatly

²⁶ Averroes, *Epitome of Parva Naturalia*, trans. H. Blumberg (Cambridge, MA., 1961), 6-9 (English)].

²⁷ As Aristotle himself recognized, the Milky Way describes a great circle (Aristotle, *Meteorologica*, I:8, 345a 33-35, 346a 17, 346b 6). Gersonides claims that the first and third of Averroes' hypotheses cannot account for this observational fact. The first of these two hypotheses explains the Milky Way as an *optical* phenomenon attributable to weak vision. But if this were true, how could it be perceived continuously by those who are weak in vision if it is a great circle? Similarly, if the Milky Way is to be explained as a group of very small stars packed together, the light of these stars would be quite faint because of both the smallness of the stars and their distance. Yet the Milky Way is readily observable!

²⁸ All the manuscripts and the printed editions read:



But since Gersonides will qualify Averroes' hypothesis in an important respect, this reading cannot be correct. I emend



²⁹The expression



doesn't fit either, since Gersonides is going to reject the theory Averroes has suggested. Accordingly, I emend it to



³⁰Gersonides' explanation of the Milky Way amounts to a modified version of Averroes' second hypothesis, according to which this phenomenon is understood to be a part of the sphere of the fixed stars that receives light from other heavenly bodies. Whereas Averroes maintains that this part of the sphere receives light from the stars, Gersonides claims that most of the light comes from the sun (*The Wars*, Bk. 5, pt. 1, chap. 53). Gersonides' theory is similar to the view of Philoponus, who claimed contrary to Aristotle, that the Milky Way is a celestial, not sub-lunar, phenomenon belonging to the sphere of the fixed stars (W. Böhm, *Johannes Philoponus: Ausgewahlte Schriften*, (Paderborn, 1967) 325-26)

-77-

blessed above all blessing and praise, [for] He has guided us to the truth [in these matters].

This part of the [Book V] was completed on the twenty-fifth day of the month of Kislev of the year 5098 [i.e., November 28, 1328].

-78-

BOOK FIVE

Part 3

CHAPTER I

The views of our predecessors on the producing agent of sub-lunar phenomena.

CHAPTER II

Arguments in favor of these views.^a

CHAPTER III

A critical analysis of these arguments to determine which of them are valid or invalid.

CHAPTER IV

An investigation into this subject according to the truth of the matter.

CHAPTER V

A proof that there exists an agent that is the law of existent beings in their entirety, in so far as they constitute a unity in it.

CHAPTER VI

A proof that the heavenly bodies possess a separate (i.e., incorporeal) intellect that moves them via

conception and desire and that they do not possess a corporeal soul, as Avicenna maintained [according to what has been reported on his views].

CHAPTER VII

A discussion about whether the separate intellects apprehend their causes and their effects and how [they apprehend them].

CHAPTER VIII

A proof that the movers of the heavenly bodies are not [arranged as] causes and effects in the way that the earlier philosophers have maintained.

CHAPTER IX

A proof that the movers of the heavenly bodies apprehend of the law of existent things only that which emanates from them without^b the mutual mixing of the light from their stars.

CHAPTER X

A proof that the ratio of the velocities of the heavenly bodies is [expressible by] a rational number.

-79-

CHAPTER XI

God is not the intellect that moves the sphere of the fixed stars, as some have thought.

CHAPTER XII

A discussion (as far as is possible for us) of the divine attributes and the relationship between God and the movers that are derived from Him.

CHAPTER XIII

What is the producing agent of sub-lunar phenomena?

CHAPTER XIV

The importance of this whole book [relative to] the other sciences.

-80-

CHAPTER I

OUR inquiry is now concerned with the separate existent, whether it exists and what is its nature, as far as we can arrive at such knowledge. There are two kinds of proof in this domain: (1) from the generation of animate things in the sub-lunar world, as has been explained in the *Book of Animals*, according to all the commentators except Averroes, as it would appear from his commentary on the *Metaphysics*; ¹(2) and from the movements of the heavenly bodies, as has been explained in the *Physics* and in the *Metaphysics*. Since it is obvious that our knowledge of the generation of animate things is more certain than our knowledge of the heavenly bodies because^a the latter are much more distant from us both in essence and in space, it is proper that we begin our inquiry with an analysis of the generation that animate things have on earth to see whether this process requires^b the existence of a separate substance [i.e., an incorporeal agent] that is the cause of this generation, or whether it does not, as Averroes thought. And if this kind of generation does require a separate agent^c, we shall investigate the precise manner in which this [process] is derived^d from this agent. For, in addition to providing us with information

concerning the essence of such a separate substance, this inquiry will also help us to understand the nature of other separate substances, as shall be pointed out in the sequel. Since error in this inquiry results in complete intellectual and moral imperfection, as shall be seen by the reader after he will have mastered the content of this book, it is necessary that we give an exhaustive analysis of this problem so that no doubts will remain. Therefore, it will be necessary first to cite the positions of our predecessors which should be examined in this investigation, and the arguments that have been adduced in favor of these views; for this procedure will help us find the truth in this topic so that no doubts will remain.

Themistius maintained that the power responsible for the generation of all terrestrial things is an intellect^e and that from this intellect emanate those powers in the seeds by virtue of which the perfect and wise [arrangement exhibited] in the generation of these terrestrial things is derived. This is evident from his Commentary on Book XII of the

¹That is, Averroes departs from this interpretation of the *Book of Animals*.

Metaphysics.² Now Averroes reports that Themistius did not limit this [process] of generation only to animate things but extended it to all terrestrial generations, as Themistius himself says in his [commentary on Aristotle's] *On the Soul*.³ For he [i.e., Themistius] says there that the soul is not merely the [place] in which are located all the forms, i.e., both intelligible and perceptual, but it is also that which puts all the forms in their [respective] matters and creates them [i.e., the forms].⁴ This seems to have been the view of Avempace [*ibn Bajja*] as well: he agrees that the generator [of terrestrial things] is an intellect. This is what Averroes reports in his commentaries upon *The Book of Animals*⁵ and the *Metaphysics*. Avicenna too held this view, as Averroes reports in his commentary on Books XII and VII of the *Metaphysics*.⁶ Al-Farabi, however, raised a difficulty about this view, as Averroes relates. But we have found in his brief essay *On the Nature of the Intellect* that he agreed [with the thesis] that the Agent Intellect bestows forms in generated substances. This is quite clear from what he says there.⁷ All of these philosophers agree then that the agent of these generations is an intellect and that it produces them by itself or^f by means of powers emanating from it [that reside] in the matter of the generated matter, as would appear from Themistius' account. According to Averroes' understanding of their views -- which he sets out to refute -- this separate agent gives the form to the generated substance at the end of the generation; but the process of receiving this form is, according to their view, not attributable to this separate agent. We do not

²Themistius' commentary on Book XII of Aristotle's *Metaphysics* was quite popular in the Middle Ages. Although the Greek original is no longer extant, the work survives in Hebrew and Latin translations, which were edited by S. Landauer and incorporated into the Berlin edition of Aristotle's commentators, (*Themistius in Aristotelis Metaphysica, XII*, ed. S. Landauer, (Berlin, 1903), Hebrew, page 8].

³*Themistius in Aristotle's De Anima*, ed. Heinze (Berlin, 1899), 98 ff.

⁴Averroes, *Long Commentary on the Metaphysics*, ed. M. Bouyges (Beirut, 1938- 1948), vol. 2, p. 882 (Arabic); Latin (Venice, 1574), 181 C. The terms *tzurot tnuksalot*, *tzurot muhashot* are the Hebrew equivalents of the Latin terms used by Thomas Aquinas: *species intelligibilis* and *species sensibilis*. That which the knower receives first through sensation are senseimages of particular entities existing in nature. The intellect then abstracts from these images (*species sensibilis*) all their idiosyncratic features, thus forming a concept, or the *species intelligibilis*. (Aquinas, *Summa Theologiae*, pt. I, question 84, articles 4, 6, and 7; question 85, articles 1 and

2).

⁵Averroes, *Commentarium de De Generatione Animalium* (Venice, 1562), Bk. II, 75 K-M (Latin). This seems to be a middle commentary, although Steinschneider argued that it is a paraphrase. (See H. Davidson, "Averroes on the Active Intellect as a Cause of Existence", *Viator* 18 (1987), 203 n. 79).

⁶Averroes, *Long Commentary on the Metaphysics*, vol. 3, Bk. XII, 1498-99; vol. 2, Bk. VII, 882. Latin: XII, 304 G; VII, 181 B.

⁷An English translation of most of this essay is given by Arthur Hyman in *Philosophy of the Middle Ages*, ed. A. Hyman and J. Walsh (Indianapolis, 1983), 215-21.

-82-

know whether Averroes found this opinion explicitly in their writings or if he merely extrapolated it from them, for we possess very few of the writings of these philosophers.

Now, as far as Averroes is concerned, we find three different opinions on this topic. The first view is the one we find in his *Epitome of On the Soul*. There he maintains that the ^g Agent Intellect is the agent in the [various] generations of animate creatures. For he says there that the conjunction of the Agent Intellect with the semen and the other seeds is only an accidental **conjunction**; i.e., when the Agent Intellect is conjoined with them so as to generate from them whatever it generates. It is not, thereby, their proximate form, as is the case with the movers of the heavenly bodies, which are the proximate forms for the bodies that are moved by them. ⁸A second view is found in his *Commentary on the Book of Animals*. There he holds the view that the generator of these phenomena is not an intellect but a soul-power ⁹in the seed and that the generator of the soulpower itself is a separate [substance]. He says that herein is [proof] of the existence of a separate mover different ^h from the mover whose [existence] was demonstrated in the *Physics*ⁱ, and that the latter is prior by nature to the former. For when this [prior] mover disappears, the other agent disappears; the converse, however, is not true. That is, when the matter is prepared by and has the proper proportion of heat ¹⁰that results from the heavenly bodies, this ^j soul-power in the seed emanates from this separate power. It would seem that by this statement Averroes means that the generator of this soul-power is the Agent Intellect. [But] he claims that the Agent Intellect cannot be the first cause of all [terrestrial] existents, since it cannot do its job unless the heavenly bodies have prepared the

¹⁰*Ha-hom ha-mesho'ar; θερμότης σύμμετρος* literally, "the measured heat". Aristotle, *Generation of Animals*, II, 743a 27-28, 777b 28; *Meteorologica II*, 362a 4-6. Davidson has suggested the translation "tempered heat".

⁸Averroes, *Epitome of De Anima*, (*Talkhis Kitab al-Nafs*), ed. A. Ahwani, Cairo 1950, pp. 40 ff; C. Touati, *La Pensee et Théologie de Gersonide*, 326.

⁹Averroes, *Middle Commentary on the Book of Animals* (Latin), 751. *Ko'ah nafshiyi; quwa nafsanīya*. Literally, "soul-power", or "soul-faculty". Touati renders it as "faculté psychique" (*La Pensée*, 343; *idem*, "Les problèmes de la generation et le rôle de l'Intellect Agent chez Averroes," *Multiple Averroes*, ed., J. Jolivet (Paris, Les Belles Lettres 1978), 157-65). Similarly, Pines translates it as "psychic force", or "psychic faculty". (Pines' translation of *Maimonides' Guide of the Perplexed*, II:6, III:46.) Since in contemporary American English the term "psychic" has connotations irrelevant to the present context, it would be better not to use this term to translate the phrase *Ko'ah nafshiyi*. Along with Davidson, I render it as "soul-power" (H. Davidson, "Averroes on the Active Intellect as a Cause of Existence," *Viator* 18 (1987), 210, 213). In his *Generation of Animals*, Aristotle claims that there is a power (*dunamis*) in the semen that shapes and directs the development of the fetus. He suggests that this power is soul or soul-like (*Generation of Animals*, II:1, 734a 1-2, 736a

31ff. See A. Peck's valuable comments in his Introduction to his edition of this work in the Loeb Classical Library, pp. 1ii-iv).

-83-

matter. Al-Farabi also advocated this view in his essay *On the Intellect*; i.e., [he claimed that] the Agent Intellect itself is not sufficient to [function as] the first principle of all [sub-lunar] existents, since it requires some other factor in order to do its job. Hence, it needs another principle that is prior to it. ¹¹

Averroes' third view is found in his Commentary ^k to Book VII of the *Metaphysics*. ¹² There he maintains that the generative power is in the seed; that it is itself generated in the seed by a seed-bearer [i.e., the parent] and the heavenly bodies; and that it is not a separate substance -- all the more so not an intellect -- for a corporeal form, according to Averroes, must be generated from a corporeal form. Hence, in these cases of generation, no separate form enters the picture, except in the generation ^l of man, for the intellectual faculties are not intertwined with matter. It ^m follows that what is not mixed with matter in any way is generated from that which is not mixed with matter, just as it is necessary that whatever is mixed with matter is generated from that which is mixed with matter. Averroes has mentioned this doctrine elsewhere: ¹³ i.e., that there is no need to postulate a separate substance as the cause of generation, except in the generation of man. ¹⁴

¹¹This prior principle, or cause, is responsible for ordering the heavenly bodies and their movers in such a way that the sub-lunar matter can receive the operations of the Agent Intellect (Al-Farabi, *On the Intellect*, trans. A. Hyman, 220).

¹²Averroes, *Long Commentary on the Metaphysics, VII*, commentary 31, p. 882 (Arabic); Latin 181 H-L.

¹³Perhaps he is referring to Averroes' *Epitome on the Metaphysics*, translated into German by S. von der Bergh (Leiden, 1924), 40, 44. (Touati; *La Pensée* 326, n.10).

¹⁴Aristotle's biology and his specific doctrine about the role of soul as an efficient cause in embryological development have been topics of considerable interest in the current literature. The anthology of essays, *Philosophical Issues in Aristotle's Biology*, edited by Allan Gotthelf and James Lennox (Cambridge, 1987), is a good introduction to these topics. Gotthelf's essay "Aristotle's conception of final causality" is especially helpful (chap. 8). Another contemporary essay is also relevant: *Soul as Efficient Cause in Aristotle's Embryology*, by Alan Code in *Philosophical Topics 15* (1987), *Ancient Greek Philosophy*, ed. L. Spellman. D.M.Balme's notes to his translation of *On Generation of Animals*, Bk. I are also valuable. (Clarendon Press: Oxford, 1972).

-84-

CHAPTER II

AFTER having cited the views of our predecessors among the interpreters of Aristotle concerning the agent of these ^a generated phenomena, it is now necessary that we discuss whatever arguments that have been brought forth in behalf of these positions, in so far as we have found such arguments either explicitly or implicitly in their writings.

The view of Themistius and his followers can be supported by the following arguments. First, it seems that a material form has no power to generate another material form; rather, bodies work upon and are affected by other bodies with respect to their qualities not their essential forms. For

example, some bodies heat up others, whereas some become cold from other bodies; some bodies become moist or dry by other bodies. But we do not find an essential form operating upon another [essential form]. All the more so [is this the case] for the soul; we do not observe soul making another soul, as we do observe heat [in a hot object] making [another object] hot like itself. Nor is this the case for the soul only; rather, [it is also true] for the other essential forms of phenomena in the sub-lunar domain. For example, when a fire makes another fire like itself from a heavy body, it does not operate upon that heavy body by means of its essential form, i.e., lightness; since it has been proven in the sciences that fire has no active power other than heating. Now if this is the case, the generation of fire in the body that is burned by means of another fire like it should be explained by either of two ways: (1) Either the generation of the form of fire in the burnt body is consequent upon the generation of the heat of fire in the body [which is an accident], just as accidents are consequent upon the generation of forms. But this is unacceptable, [since forms are not generated from accidents]. Moreover, it would follow from this that a form would be generated from no form [at all], which is absurd. For, according to certain general principles, that which brings something else from a state of potentiality with respect to some feature to actuality possesses ^b that feature in actuality. ¹(2) Or, there is a form that generates this generated form and the former is a separate form, since material forms do not have this kind ^c of activity. This argument in behalf of the view of Themistius we have found in Averroes' commentaries upon *The Book of Animals* and the *Metaphysics*. ²

¹Aristotle, *On Generation and Corruption*, I: [5](#).

²Averroes, *Commentarium de De Generatione Animalium*, II:3; *Long Commentary on the Metaphysics*, 1492- 1494 (Arabic). C. Genequand, *Ibn Rushd's Metaphysics*, (Leiden, 1984), 105ff.

This point [requires] examination. For it would seem that some material forms do generate form in matter; i.e., the receiver of the nutriment turns ^d the nutriment into its own substance and endows the nutriment with the forms of the homomerous parts that are present in it; e.g., it transforms the nutriment into flesh in the flesh ^e. ³Similarly ^f with the other homomerous parts in the body. ⁴Moreover, we actually find that fire produces another fire like it by means of its essential form; for the essential form of fire is heat not lightness; lightness is actually a secondary quality consequent upon the primary qualities. That lightness is not the form of fire, can be shown as follows. The form of something is that from which the activities of that thing are derived. Now lightness is such that from it no activity in fire ^g is derived except accidentally; i.e., when [fire] is not in its natural place it moves toward it [in an upward direction]. But this motion is only accidental to the fire, as has been explained in the *Physics*: for rest is natural for the elements, not movement; hence they do not have motion in their [natural] places. ⁵On the other hand, the activities of fire derive from heat, whether it is in its proper place or not; hence, it is proper that heat be the form of fire.

Furthermore, the form of something is not appropriately [predicated in] a relative sense; rather, [it predicated absolutely] of that which has the form. ⁶Lightness, however, is predicated [of something] relatively, such that fire [for example], is lighter in one place than in another; i.e., the closer it is to the center [of the universe] the lighter it is, whereas in its proper place it is no longer light, which is [contrary to] what Aristotle says. ⁷And so you find that some of the elements [i.e., air and water] are light in one place but heavy in another, a fact that proves that lightness

³Averroes, *Epitome of On Generation and Corruption (Hebrew)*104, (English) 116. Aristotle, *On Generation and Corruption*, I:5.

⁴Aristotle, *Generation of Animals*, II:6, 743a 4-743b 18. See the valuable analysis given by A.L. Peck in the Introduction to his edition of this work published by the Loeb Classical Library.

⁵Aristotle, *Physics*, VIII:9; *On the Heavens*, III:2.

⁶In *On the Heavens*, IV:1, Aristotle distinguishes between the absolute and the relative, or comparative, predication of "heavy" and "light".

⁷Gersonides seems to be denying Aristotle's theory of light and heavy, as outlined in Bk. IV of *On the Heavens*. For on that theory fire in its proper place is absolutely light, i.e., has no weight at all, and is always moving away from the earth towards the circumference of the sub-lunar sphere; moreover, in its own place it is light (Aristotle, *On the Heavens*, IV:3-5). Gersonides, however, follows the Platonic theory that Aristotle criticizes, according to which light and heavy are relational properties (Plato, *Timaeus*62 C-63 E). This latter theory has the consequence that light and heavy are properties that are assigned to bodies when they are *not* in their proper places. In the case of fire this means that in its natural, or proper, place it is not light in the sense that it is no longer in motion; to be light is to be moving in an upward direction. When fire is near the center of the universe, it is lighter in the sense that it is farther away from its natural place. That is, the farther away it is the lighter it is; for lightness is, for Gersonides, an accidental property of fire, and the more "abnormal" or unnatural state of an element is one in which it has its accidental properties to the maximum degree [Themistius, *In Libros Aristotelis De Caelo Paraphrasis* in: *Commentaria in Aristotelem Graeca* 5.5. (Berlin, 1903), 157 (Hebrew), 229-30 (Latin). F. Solmsen, *Aristotle's System of the Mysical Universe*, (Ithaca, 1960), 279-83, n. 25].

-86-

and heaviness are not forms of elements. Hence, it is evident that lightness is not the form of fire.

Moreover, a composite substance is such that some of its activities can be attributed to the^h matter and some activities to the form. For the matter is [by virtue of these activities] a form in some sense; for example, a man manifests certain activities deriving from that which serves as matter in him, such as nutritive processes and sensation. But he also exemplifies activities by virtue of that which serves as form in him, e.g., the intellectual faculty. Now, since it is obvious that different activities are derived from the heat in fire, it is clear that if the heat in fire were [merely] the matter vis-a-vis lightness, [which is alleged to be the form], fire would be composite and not simple and there would be another body prior to it having heat as its form. All of this, however, is absurd. ⁸Hence, it is clear that lightness is not the form of fire but heat, which is contrary to the hypothesis [of Themistius and his followers]. The statement in the *Categories* that substance has no contrary is to be construed as a report of a well-known doctrine not as the truth; for elements are essentially contraries to each other. ⁹Indeed, it is in this sense that they are elements. In this way the argument of the ancients in behalf of the thesis that there is a separate [form] that endows sub-lunar things with their forms can be refuted.

Second, [Themistius continues to argue], that which is potentially [some feature] is actualized by something that actually possesses in some sense that feature. Since it is evident in those things that are not born of seeds that there is no material form in actuality [i.e., in the parent]

⁸As an element fire is simple.

⁹In *Categories* 5, 3b24, Aristotle claims that in the category of substance (e.g., horse) there are no contraries. For example, the horse Silver is not the contrary of the horse Whirlwind. Nor is

one species, say dog, the contrary of another, cat.

However, in the present discussion Aristotle, especially as Themistius interpreted him, was understood as having claimed that the elements do have individual essences, i.e., they are substances. Thus, it is of the nature of fire to move upward. (Aristotle, *On the Heavens IV:4*.) Now, if this is so, Gersonides argues, some substances will be contrary to each other, i.e., the elements; for the elements are by their nature contrary to each other. Hence, Aristotle's early view of the *Categories* has to be understood not as his own position but merely as a report of a widely held doctrine.

-87-

similar [maskim] ¹⁰ to the generated object to which the generation can be attributed, it is necessary that there be here a separate form that is responsible for this generation. Indeed, this can be shown to be true even for things that are generated from seeds! For the seed does not have a soul in actuality, only potentially; and everything that exists only potentially requires something in actuality [to bring it to a state of actuality]. Hence, there must be a separate form that generates these things. Themistius alludes to this argument in his commentary on Book XII of the *Metaphysics*; Averroes develops it in detail in his Commentary on this book. ¹¹

Third, [Themistius argues], it is evident that sub-lunar substances must have been previously endowed by nature with proportions and forms by virtue of which they perform their [proper] activities, provided they have the appropriate matter. In the case of man, [for example], although he is born of another man, the father does not [really] possess the skill [for the generation of] this constitution, which cannot exist in a more perfect way. Rather, this [constitution,] is such by virtue of the proportion and forms ¹ with which each of the substances has been naturally endowed. It is not the skill of the father but the proportion [that is responsible for the generation of a properly organized being]. A body does not have any effect upon [another] body except upon its limit [i.e., surface]; whereas the nature operates upon the whole extent of the body. Now, nature does not understand what it does in bringing forth what has been intended; for it doesn't actually think and deliberate while performing its operations. This shows that these very proportions have been inspired by some superior, nobler and higher-level cause, i.e., the World-Soul, which according to Plato is generated from the movers of the heavenly bodies, whereas according to Aristotle it is generated from the sun and the inclined sphere [i.e., the ecliptic]. Hence, the soul performs its operations accomplishing the [intended] goal, although not knowing the goal. This is similar to the situation where we see men inspired to say certain things ^j and to predict the future but they do not understand what they are saying. We have found this argument in Themistius' commentary on Book XII of the *Metaphysics*. ¹²

¹⁰For the terminological analysis of *makism* see Touati, *La Pensée* 327, n. 12 and C. Genequand, *Ibn Rushd's Metaphysics*, (Leiden, 1984), 25 n.2.

¹¹Themistius, *Paraphrase of Aristotle's Metaphysics*, Bk. XII, 9(Latin), 7-8(Hebrew); Averroes, *Long Commentary on the Metaphysics*, Arabic, 1491- 1494; Latin Book XII, c. 3, 303 ff. Genequand, *Ibn Rushd's Metaphysics*, 105. Aristotle, *On the Generation of Animals*, II:1, 3. S. Pines, "Some Distinctive Metaphysical Conceptions in Themistius' Commentary on Book Lambda and their Place in the History of Philosophy", in: *Aristoteles Wirk und Wirkung* ed., J. Wiesner, (Berlin, 1987) V.2, 177-204.

¹²Themistius, *Paraphrase of Aristotle's Metaphysics*, Bk. XII, p. 9(Latin), p. 8(Hebrew). Genequand, [106](#).

Gersonides' paraphrase differs somewhat from both the Hebrew text of Themistius and the

Averroes citation of it, especially in regard to the notion of the World-Soul (*hanefesh asher ba 'aretz*). (Plato, *Laws*, X; *Timaeus*, 34A-C.) In the original text and the Averroes citation, it is claimed in behalf of Plato that this soul is generated from *Ha-'elohim hasheniyim or Diis secundiis* which, literally translated, are *secondary gods*. (Plato, *Timaeus*, 41A.) However, Gersonides claims in behalf of Plato that this soul is generated from the movers of the spheres. The latter, however, can be regarded, at least metaphorically, as semi-divine, since as separate intelligences they were identified with the angels. (Maimonides, *Guide*, II:4-6. Cf. Wolfson, "Hallevi and Maimonides on Design, Chance and Necessity", *PAAJR*, XI (1941), 146-49.)

-88-

The view of Averroes as found in his *Epitome of On the Soul* and in his commentary on *The Book of Animals* is similar to some extent to that of Themistius and his followers; for [in these writings he maintains] that sub-lunar generation is [ultimately] traceable to an intellect that endows [sub-lunar substances] with their forms. However, in his commentary to Book VII of the *Metaphysics* he claims that the generating power^k is not a separate [substance]; and several arguments in behalf of this view can be extracted from his discussion.¹³ Some of them maintain, so it appears, that a separate [substance] cannot bestow forms, neither indirectly nor directly; other arguments maintain that the separate [substance] cannot bestow forms in the manner formulated by earlier philosophers i.e., the body produces a change in the matter by virtue of the qualities in it, whereas the separate efficient cause bestows the form. [Let us now consider Averroes' argument in detail].

First, if the view of the earlier thinkers be granted i.e., the separate [substance] gives the form whereas the body that is the [proximate] agent in generation produces the change in the matter --, it would follow that form would be essentially generated, which view Aristotle has demonstrated to be false concerning generation.¹⁴ We have explained this point in detail in Bk. 1,¹ chap. 4 of this treatise.

Someone might object that this [process of generation as developed by the earlier philosophers can be construed] as not implying the generation of a form: the form itself is not generated; only its inherence in matter is generated. To this Averroes would say that on this view the form would not require a substratum except in the sense that the body needs its place, [i.e., accidentally]. And thus it could happen, for example, that the form of a horse could exist without any horse^m. But this is obviously false in the case of material forms.¹⁵ Moreover, if this objection be granted, the following dilemma would ensue concerning the form in a generated substance; either the form exists in it *before* generation or it comes to it by motion from the outside. The latter alternative is obviously false,

¹³ *Long Commentary on the Metaphysics, Arabic* 837ff, Latin [171 L](#)- [181 L](#).

¹⁴ Aristotle, *Metaphysics*, XII:3; *On Generation and Corruption*, I:3.

¹⁵ Averroes, *Commentarium de De Generatione Animalium*, II: [3](#), [75 M](#).

-89-

since anything that moves is a body; hence it is impossible for a form to be essentially in motion. If it is said that the form exists in it before generation, it can be easily seen that this would imply that in every terrestrial body all the forms, which the primary matter is capable of receiving, would exist simultaneously. Hence, the forms of fire and of water would co-exist in actuality in every body in this world, whether simple or composite. But this is manifestly absurd, i.e., that

contraries can coexist in one subject. This view is actually the view of Anaxagoras who maintained that in the beginning all things were mixed together in an indeterminate [way].¹⁶ Accordingly, for him everything is in everything else. Aristotle has already demonstrated the absurdity of this view. This argument is found in Averroes' commentary on *The Book of Animals* and in several places in his commentary on the *Metaphysics*. Although we have not found it there in this precise manner, we have extrapolated it from his discussion and have supplemented it.

Second, if we were to say that the form [of the substance] is generated by a separate form, whereas the body [e.g., the heavenly bodies] prepares the matter for the reception of this form, the form would be generated *ex nihilo*.¹⁷ Nor could it be said [in attempting to avoid this latter consequence] that the form [of the substance] is generated from the separate form which produces^o it in the way in which verdigris [i.e., copper sulfate] is generated from copper; for a separate form does not change essentially such that it would become a corporeal form. Rather, the separate form *produces* the corporeal form. Now, Averroes' theory of generation does not suffer from this^p absurdity. For [on his theory] generation is the generation of a composite of matter and form in so far as it is numerically one; and this [generation] does imply a substratum, i.e., the matter from which the generated substance originates.¹⁸

Third, it is impossible for a separate form to produce a form in^q matter, according to what Averroes says in his *Commentary on the Book of Animals*. For a separate intellect acts by itself [requiring] nothing else [for its operation]; whereas the agent that generates animate creatures employs a corporeal instrument, and whatever uses an instrument does not act by itself. This argument is found in his *Commentary on the Book of Animals*.¹⁹ It appears that what he means by this is that the separate intellect does

¹⁶Aristotle, *Metaphysics*, I: 8. I have translated *bilti takhlitiyyi* in this context as "indeterminate" to correspond to Aristotle's *ἀόριστον* (Ibid., 989b 18). Alternatively, the phrase could be rendered as "mixed together in an infinite [mixture]".

¹⁷Averroes, op. cit., 75M.

¹⁸Thus, for Averroes there is no creation *ex nihilo*. (Averroes, *Long Commentary on the Metaphysics*, Arabic, 1498; Latin, 304 F-305 F. Genequand, *Ibn Rushd's Metaphysics*, 105 ff.

¹⁹Averroes, *Commentarium de De Generatione Animalium*, 75 K. Touati, *La Pensée*, 331.

whatever it does by itself and not with any instrument; whereas the form that generates an animate creature employs some kind of instrument, i.e., either the soul-heat²⁰ in the seeds or something similar to this in things that are not born with seeds. Or, perhaps he means by this that in the case of the separate intellect its activity is [identical with] itself, i.e., cognition, since cognition is its proper activity; whereas in the case of this form [that generates animate creatures] its activity is different from itself, i.e., [its activity produces] a generated corporate form. That [the activity] of this form is not identical with the form itself is evident; for this form employs a corporeal organ in its operation and a body is the recipient of this activity. The first of these interpretations seems more likely, [since] it is consistent with Averroes' views^r on this topic in his commentary on Book XII of the *Metaphysics*. There he presents a position similar to the first interpretation.²¹

Fourth, the view of Themistius and other commentators that corporeal forms are created from separate forms that are similar to them is the view of Plato on the Forms. In the *Metaphysics* Aristotle has shown the absurdity of this view.

Fifth, if it is assumed that the separate form bestows the form after the matter has been changed and prepared to receive it, then an act that is numerically one would derive from two agents: one agent would cause the act [of generation]; the other would give the [final] form. ²² But this is

²⁰ *Ha-hom ha-nafshiyyi*; θερμότης ψυικν Aristotle, *Generation of Animals*, II:1, 732a 19, II:4. 739a 12, 739b 24; III:4, 755a 20. Davidson, Averroes on the Active Intellect.....", 213. Touati, *La Pensée*, 332-33; Touati translates this term as "la chaleur psychique", "la chaleur vitale". Peck's discussion of this and related matters is very useful. (Introduction to his edition of Aristotle's *Generation of Animals* in the Loeb Classical Library)

²¹ Averroes, *Long Commentary on the Metaphysics*, Arabic, 1495- 1496; Latin, XII, 303M. Genequand, 107-08. The second interpretation makes use of Aristotle's distinction between activities that result in some object (e.g., carpentry) and activities that do not give rise to an object other than the activity itself (e.g., thinking). Aristotle, *Metaphysics*, IX:8, 1050a 23-29.



In this context it is difficult to find suitable English equivalents for the two underlined words. The term *takhlit* can mean *form* (Aristotle, *Metaphysics*, V:17. Wolfson, *Crescas' Critique of Aristotle*, 358-59). But it can also connote *end*, or *goal* (Aristotle, op. cit.). Moreover, in many contexts the form and end of substance coincide (Aristotle, *Physics*, II:7.). On the other hand, *po'al* generally means *act*, which in Aristotle generally derives from or expresses the form of a substance. How then are we to discriminate between *po'al* and *takhlit* if both terms have to do with the form of a substance?

At the end of the presentation of Averroes' seventh criticism, however, some elucidation of this difficulty may be obtained. There, Gersonides distinguishes in behalf of Themistius and his followers two agents in generation: one that bestows the form/end of the process of generation, or the final form (*ha-takhlit*), the other that is actually the agent for the process itself (*sheyif al ha-havayah*), or the activity (*po'al*) of generation. This interpretation seems to be supported by Gersonides' criticism of Themistius' second argument in the next chapter.

It should also be noted that in Averroes' subsequent criticisms other candidates are suggested for this division of labor in generation that is part of Themistius' theory. In any case, both Averroes and Gersonides will reject such a view, no matter how it is interpreted.

-91-

absurd; for an act that is numerically one derives from *one* agent. ²³ If someone were to suggest that the final form, which is given to the matter by the [agent] that changes [the matter], is the tempered form, ²⁴ whereas the separate agent bestows the soul-form, in animate creatures, Averroes would reply as follows. If it were possible for the existence of the tempered form when it exists by itself to be like its existence when it receives the soul, then the term referring to it would be univocal in both cases. But this is not the case; for the term "flesh" when predicated of flesh having no soul and of flesh having soul [i.e., alive] is predicated equivocally. Accordingly, it is evident that the tempered form does not derive from one agent and the soul from another agent; for if this were the case, no [one] nature would be generated for the tempered form when the soul is generated ^s in the mixture. ²⁵

Sixth, if [there were two agents], the substratum and its form would be two distinct entities, since they would be generated in two distinct processes of generation. And it is clear that whatever has been generated in more than one process of generation is not numerically one. ²⁶

Seventh, I don't know why it is necessary to assume that what gives the form is not the same thing as that which prepares the matter to receive the form which is attained at the completion of the process of generation. It is clear that that which ^t prepares the matter also bestows some [kinds] of forms: the latter are the forms that function as matter for the form which is the completion of the process of generation [but] are [also] themselves ^u forms of certain terrestrial substances. ²⁷ Hence, it is not impossible for [this agent] to bestow the forms. Moreover, if it is alleged that these forms which serve as matter in a [generated] thing are generated by ^v that which prepares the matter to receive forms, whereas in a thing in which they serve as [terminal] forms they are generated from a separate agent, it would follow that the same forms would derive

²³ Averroes, *Long Commentary on the Metaphysics, VII*, Arabic 884-85; Latin, 1811. Here Averroes describes this theory as claiming that the substratum comes from one agent, whereas the form derives from another agent. (Davidson, 216.)

²⁴ *Ha-tzurali ha-mizgit, sura mizajiya; Latin "forma complexionalis"* (Averroes, *Commentarium de De Generatione Animalium, II:3, 76 A*). Although it is difficult to find a suitable English equivalent for this expression, the term connotes the form resulting from the mixing of the elementary qualities or bodies. This form serves as a preparatory stage for the reception of more complicated forms, or powers (cf. A-M. Goichon, *Lexique de la Langue Philosophique D'Ibn Sina, (Paris, 1938), 380-81*. Davidson, *"Averroes on the Active Intellect...."*, 213.

²⁵ If two agents were responsible for generation, a unified organism, i.e., one substance or nature, would not result (Touati, *La Pensée*, 330).

²⁶ Averroes, *Long Commentary on the Metaphysics, VII*, Arabic 884; Latin 181 H.

²⁷ These "preparatory" forms would appear to be the nutritive and sensory souls.

from different agents. But this is absurd. This would be analogous to saying that the nutritive soul in plants is generated from a separate agent [because in plants this is their final form], whereas in animals the nutritive soul is generated by that which prepares the matter to receive the sensory form. ²⁸ Furthermore, if this were the case, the form that derives from that which prepares the matter would be superior to the form that derives from that which gives the [final] form. For example, the nutritive soul in animals would be superior to the nutritive soul in plants, just as the wall that is part of a house is superior to the wall that exists by itself. ²⁹ None of the earlier philosophers mentions this argument; but it is sufficient to refute the account of generation in some of the ancients, as Averroes interprets them, according to which the agent that accomplishes the completion of the generation [i.e., the final form] is not the agent that performs the [process of] generation.

Eighth, if this position were admitted, it would appear that there would be many forms active in producing one and the same generated substance. But this is clearly absurd; for one and the same act derives from one agent. That there would be many forms active in producing one substance can be shown as follows. In the generated substance there are many forms, some of which serving as the perfection of others. Now on this hypothesis it would follow that there would be many forms active in producing the corporeal forms [and] that the former would be similar to the latter in some respect; for that which is brought forth from a state of potentiality to actuality [with respect to some condition] agrees with the agent which [has this condition] in actuality. It would seem that these producing forms must be many, since forms are brought into a unity by virtue of the matter [of the generated substance in which they all inhere]; for in the matter some of them ^w are the perfections of others, since the matter receives some of the forms via others.

However, forms that are devoid of matter [i.e., separate forms] would not seem to be able to possess this kind of unification. This argument was also not mentioned by the ancients; but it is sufficient to throw into doubt the claim that there is here a separate substance which produces a form in matter. Hence we have thought it appropriate to mention it in this context.

²⁸In animals the vegetative serves as matter for the sensory soul.

²⁹In an animal the nutritive soul, or nutritive faculty, is a part of a hierarchical system of faculties, whereas in plants it is the sole faculty. Now, the position criticized by Averroes implies that in an animal the nutritive soul would be superior to the nutritive soul in a plant *simply because it is in an animal*, despite the fact that it is generated from the power which prepares the matter to receive the higher forms; whereas in a plant the nutritive soul is generated by a spiritual power that gives the essential form to the plant, since in a plant the nutritive soul is its essential form (Aristotle, *On the Soul*, II:2-3, especially 414b 30ff; *History of Animals*, VIII:1.).

-93-

Ninth, if there were a separate form producing the corporeal form which is similar to it in some respect ^x, there would be no advantage in this generation; for the separate forms enjoy a superior kind of existence than they enjoy when they are embedded in matter. Accordingly, what need would there be for such embodiments? How was it possible for something of superior status to have become inferior? If it is replied that this has occurred in order that these matters have a better kind of existence, this would imply that the generation of these forms was for the sake of matter. But this is contrary to the view of Aristotle. ³⁰Hence, it would seem to follow from this that the generation of corporeal form does not derive from a separate form that is similar to it in some respect, in the way that Themistius and his followers had maintained.

It would also seem that it follows that a corporeal form is [in general] not generated from a separate form. For ^{a1}, since a separate form [qua separate] cannot be similar to a corporeal form (as has been demonstrated from this objection), I ^{b1} do not know how this ^{c1} activity [of generation] is derived from the separate form. From ^{d1} the conception of [a form involved] in a craft it is possible for the form of the artifact to be produced by that craft, since it [i.e., the conceived form] agrees with this [produced] form. For ^{e1} it is obviously not possible for an axe to be produced from the conceived [form] of a chair; rather, from the conception of the form of a chair the form of a [real] chair is produced. Analogously, this shows that from a separate form a corporeal form dissimilar to it cannot be generated; for a separate form necessarily produces what it does produce by means of conception and intellection. ³¹

³⁰For Aristotle, matter is never the end of a process, only a necessary condition for it.

³¹Since the activity of a separate form is essentially self-intellection, it produces by self-understanding. This entails that what it produces is similar to it. Hence, since a corporeal form is not similar to an incorporeal form, the latter cannot produce the former.

-94-

CHAPTER III

AFTER we have demonstrated that which appears to be plausible in these views, it is now fitting to determine whether these arguments actually entail what has been concluded from them.

Themistius' first argument is not entirely correct if nothing more is said in its behalf than what [has been stated in its] present form. We do in fact find corporeal forms generating corporeal forms of the same kind; this is evident in the case of the elements, as we pointed out in the previous chapter. Indeed, we find this to be true also in the generation of parts by the organism. For example, the liver makes the food whereby it is nourished into parts of the liver. ¹ Similarly, with the other parts of the organism. Hence, in this respect it is not impossible for a corporeal form to be generated from a corporeal form similar to it. Now, we do maintain that it does not follow from this that the corporeal forms [as such] are [by themselves] sufficient to generate corporeal forms ^a. For one might argue that whereas it could be possible for the forms of the elements ² to generate their like, this is not the case in other [corporeal] forms. In the case of nutrition [it could be argued], a form in the organism is not generated, but only a quantity.

Themistius' second argument, however, does establish without doubt the existence of a separate agent that generates sub-lunar phenomena. We cannot say of things that are generated according to their kind that this corporeal form in the seed is [derived] from the seed-bearer, [or parent, as we pointed out in Bk. 1, chap.6. This point will be discussed in detail later. What the seed gets from the seed-bearer, however, is enough heat so that it can serve as an instrument in this process of generation. Since that which proceeds ^b from potentiality to actuality [is brought to actuality] by something ^c that is in some sense in actuality in that genus, it follows that there is a separate producing form to which this generation is to be ascribed. This ^d can be conceived [as follows]: either a soulpower in the seed emanates from this separate form [and by this power] the generation is completed; or the separate form accomplishes the generation without any intermediary, except the natural heat ³ in the gener-

¹ *Kevedi*; literally, "liverish". O.C. Grunner, *The Canon of Medicine of Avicenna*, (London, 1930), 119.

² *Ha-tzurot ha-yesodiyot*; the specific form of each of the basic elements (Wolfson, *Crescas' Critique of Aristotle*, 578).

³ *Ha-hom ha-yesodiyi*; literally, "the basic heat". [Davidson, *The Philosophy of Abraham Shalom*, (Berkeley, 1968) 51-521. Touati, *La Pensée*, 343: "la chaleur fondamentale".

Throughout Aristotle's biological writings there is frequent mention of the importance of heat, especially in the generation of living things. Aristotle uses several different expressions for this "innate heat" (Ross' term in his edition of Aristotle's *Parva Naturalia*, (Oxford, 1955), 40 ff.), one of which is "natural heat" *θερμοτης ουσικη* *Parts of Animals*, II:2, 648a 28; *Generation of Animals*, II:1, 732b 33; V:3, 783b 30-31; *Parva Naturalia*, 469b 7-8, 470a 19-20). *Its origin is in the heart and is the primary cause of many of the body's activities, especially movement. This heat is, however, not identical with the elemental heat of fire, which for Aristotle is harmful to living things (Generation of Animals, II:3, 737a 3ff). Thus, although the term yesodiyi can be translated as "elemental", this English term should be avoided in this context; the terms "basic" or "natural" are preferable.*

ated thing, which [heat] serves as an instrument for the form that generates. In any case, it does not follow from this that there are two agents -one responsible for the generation, the other for its terminal form, as some of the interpreters [of Aristotle] have apparently thought, according to what it would appear from Averroes' criticisms of their views.

However, Averroes' refutation of this argument to the effect that this generation can occur without a separate form is not valid. In his Commentary to Book XII of the *Metaphysics* he offers the following refutation of this argument:

"The statement of Aristotle that similars [ha-muskam] are begotten from similars or from near similars ⁴ doesn't imply ^e that the similar by itself and its own form makes the form of that which is similar to it. Rather, he means that the similar actualizes the form of that which is similar to it. It is not an agent that brings ^f to the matter something from the outside or something that is extrinsic to it. ⁵ What is true for the [form of] this substance holds also for the accidents. For heat doesn't bring to the body that is warmed heat from the outside; rather, it actualizes the potential heat [of the body]. Similarly with size [of a body] that results from generation: when a [certain] magnitude is changed in generation from a quantity [into another quantity], ⁶ it is not changed by an external quantity *supervenient* to it; rather it derives from the quantity that is potentially in the thing receiving the generation. Analogously, motion in place is not something that comes from the outside because of the mover. Thus, it is not necessary that the agent be similar to and identical with [the generated object] in every respect. Indeed, someone who brings forth a soul does not put a soul in a body; rather he actualizes what was potentially a soul.

⁴ Aristotle, *Metaphysics*, VII: [9](#), 1034a [21](#) ff.

⁵ Although the printed editions and manuscripts have the phrase



which is redundant, the Hebrew version of Averroes' *Middle Commentary on the Metaphysics* just has



as does the Latin translation of the *Long Commentary on the Metaphysics*, [304](#) K-L.

⁶ The Latin version adds: in quantitatem aliam".

Accordingly, fire is generated from motion just as it is generated from another fire like it, even though motion is not fire; nevertheless, the motion actualizes what was potentially fire. The proportions and forms in the generators of animals actualize the proportions and forms that are potentially in the matter; hence, it is necessary that the former bear some similarity to the forms that they actualize; but it is not necessary that there be a complete identity. Moreover, the potentialities [i.e., powers] in the seeds that make things animate ^g are [themselves] not actually animate but only potentially animate. This is similar to the situation [in the crafts]: the house in the soul [i.e., mind] of the builder is a house only potentially, not actually. Thus, Aristotle made an analogy between these potentialities and the potentialities in the crafts. He says in *The Book of Animals* that these potentialities are divine, for they have the power to give life and are similar to powers that are considered to be intellectual because they direct [things] toward an end. ⁷ Moreover, since these seeds perform this [process] by virtue of heat and since heat qua heat performs no other action except heating, drying or hardening -- it does not make a figure or a form in an organism --, Aristotle went on to say in the *Book of Animals* that this heat is not fire or [generated] from fire; for fire destroys a living thing rather than generates them, whereas this [heat] generates the organism. ⁸ Accordingly, this heat is analogous to the heat involved in a craft which the craft measures for the purpose of performing its activities. It seems that everything resulting from crafts is made with heat; and this heat necessarily possesses a form by virtue of which the [requisite] proportion and measure are preserved. This form [in the seed] is not

animate in actuality but only potentially. And it is [this form] that Aristotle compared to [the form] in the crafts. Hence, he called this heat "soul-heat"; ⁹ but he did not describe ^h it as having a soul. This heat having form is in the seeds and is generated from the seed-bearer [i.e., the parent] and the sun. Thus Aristotle says that man generates a man like himself along with the sun ^l. The heat is generated in the earth and water by means of the heat of the sun which is mixed together with the heat of the other heavenly bodies. Hence,

⁷Aristotle, *Generation of Animals*, I: [22](#), 730b, Ilff. Davidson, [214](#). Genequand, *Ibn Rushd's Metaphysics*, (Leiden, 1984) [109](#) - [12](#).

⁸Aristotle, *Generation of Animals*, II: [3](#), 736b [35](#) -737a [7](#).

⁹Aristotle, *Generation of Animals*, II:3, 736b 30-737a 17; III:1, 752a 3. For the heat involved in the crafts see *Generation of Animals*, II:1, 734b [29](#) ff.

-97-

the sun and these heavenly bodies are principles of life in all natural living creatures. ¹⁰ The heat from the sun and the other heavenly bodies that is generated in the earth and water is that heat which generates living things [spontaneously] by putrefaction and in general anything that is generated [spontaneously] from no seed. There is no soul in actuality that is generated from the inclined sphere ¹¹ and the sun, as Themistius reports. All of this is explained in *The Book of Animals*. ¹² Aristotle attributes this activity to the sun [in particular] since its influence is here more evident than that of the other heavenly bodies. The various [kinds] of heating processes, which are generated from the heating processes of the heavenly bodies [and] which bring forth various kinds of living creatures, correspond ^j to the number of species of living creatures. And the amount [or proportion] of heat ^k found in each species derives from the amount of movements of the heavenly bodies and from their dispositions in distance relative to each other. This amount [or proportion] derives from the skill of a divine intellect, which is similar to the unity of form which obtains in one master-craft under which there are different subsidiary crafts. ¹³ Thus, when nature accomplishes some activity in the best orderly fashion without itself being intelligent, it should be understood as being supervised by superior active powers, and they are called 'intellects'. ¹⁴

In conclusion, then, Averroes maintains that all the proportions and forms are found potentially in the prime matter and exist (in some respect) in actuality in the First Mover, which is analogous to the existence of an artifact in the soul of the artisan. This is the argument Averroes advances in this place to remove ^l the second and third arguments of Themistius.

However, in his commentary on Book VII of the *Metaphysics* Averroes advances this refutation of Themistius' second argument. ¹⁵ It goes like this.

"When Aristotle's proof in this place of the claim that material forms generate [other] material forms is examined, it will be

¹⁰Aristotle, op cit., 737a [3](#) - [7](#).

¹¹That is, the annual movement of the sun in the ecliptic, or zodiacal, circle. Aristotle, *On Generation and Corruptions*, II:10, 336a 33-34. Themistius, *Paraphrase of Aristotles' Metaphysics*, Book XII, 8 (Hebrew), 9 (Latin).

¹²Aristotle, *Generation of Animals*, V: [4](#). 784b [8](#) - [9](#).

¹³Aristotle, *Metaphysics*, I:1, 981a [31](#) ff.

¹⁴Averroes, *Long Commentary on the Mataphysics*, XII Arabic 1499-1503; Latin 304H305E.

Davidson, 217-218; Genequand, *Ibn Rushd's Metaphysics*, 109-111.

¹⁵Averroes, *Long Commentary on the Metaphysics*, VII, Arabic 883-84, Latin 181 D-G.

-98-

seen ^m that it is the seeds ⁿ that give the forms to those things that are generated from seeds by means of the forms which have been given to them by the seed-bearer [i.e. parent] that ^o has generated them. However, with respect to those things that are generated spontaneously [i.e., without seeds], the heavenly bodies give them what serves instead of seeds; [they also give] the powers in the seeds in those things that are generated from seeds. All of these powers are natural divine powers producing their like, just as skilled craftsmen produce their products. Hence, Aristotle says about these activities in the *Book of Animals* that they are similar to an intellect, i.e., they perform an intellectual activity; for in so far as they do not employ a corporeal instrument they are similar to an intellect. It is in this man. ¹⁴er that these generating powers are different from [the other powers in the organism]. Physicians call them the formative powers ¹⁶ among the natural powers in the bodies ^p of living creatures. The latter powers perform in the same way as does the practical intellect, since they employ definite ^q organs and specific limbs; whereas the formative power does not use a specific limb. For this reason Galen was perplexed and said that he didn't know whether or not this is the creator. This formative power, however, operates only by virtue of the heat in the seed, but it is not a form in the seed, as is the soul, which is a form in the natural heat. Rather, this power is bound up with the seed, just as the soul is bound up with the heavenly bodies. ¹⁷ Thus, Aristotle heaped praises on this power and attributed it to the divine, and not to the natural, principles. Whether this power knows itself or indeed is a separate intellect has not, however, been established."

In conclusion, Averroes claims that if there is something [in this process] that is not a body, it cannot change the element [in the body] except by means of another body that is immutable, i.e., the heavenly bodies. It is therefore false [to assert] that separate intelligences bestow

¹⁶*Ha-ko'ah ha-metzayyer; al-quwwah; al-musawwirah*. Galen recognizes a distinct faculty, or power, of the organism that shapes and determines its development: *δύναμις τις δι' ἑαυτῆς πλάσσει τὴν διαπλαστικὴν* +03C5 *ὀνομάζομεν* (Galen, *On the Natural Faculties*, I, 5-6). Maimonides too uses this term with the same connotation in the *Guide*, II:6 (Wolfson, "The Internal Senses in Latin, Arabic and Hebrew Philosophical Texts". *Harvard Theological Review*, 28 (1934), 73, N. 23. Goichon, *Lexique de Langue Philosophique D'Ibn Sina*, 190, paragraph 373; 193, paragraph 376).

¹⁷The notion of the formative power being bound up or enclosed within the seed derives from Aristotle's discussion of the pneuma, or "hot substance", in the semen (*Generation of Animals*, II:736b 33-737a 1). The Hebrew *ne'etzar* corresponds to the Greek *ἐμπεριλαμβανόμενον*, which is translated in the Latin Averroes as "inclusa" (Averroes, op. cit., 181F). The pneuma is, according to Aristotle, analogous to the celestial element, the "fifth element", or the "primary body" (*On the Heavens*, I:2-3). Both the pneuma and the heat of the celestial bodies are generative, whereas the heat of the terrestrial element fire is destructive (*Generation of Animals*, II:3, 737a 3ff).

-99-

forms that are mixed with matter. Nevertheless, Aristotle was led [Averroes believes] to introduce an intelligence separate from matter only for the generation of intellectual powers, since for him these powers are not mixed with matter. It would follow then that whatever is not mixed with matter in any way is generated from what is not at ^r all mixed with matter, just as that

which is mixed with matter is necessarily generated from that which is mixed with matter. This is Averroes' objection against Themistius' argument in behalf of the thesis that there is a separate generating intellect similar in some respect to things it generates. ¹⁸

It is evident, however, that from Averroes' discussion on this topic it does not follow that material forms are sufficient to generate ^s a material form. Rather, it follows that there must be a separate form, to which this generation is ultimately attributable, as Averroes [himself] admits, i.e., the First Mover, in which, according to Averroes, these forms are present in the same way as the existence of an artifact is in the soul of the artisan. In short, it is clear that [even] the measured [or proportioned] heat ¹⁹ in the semen is not sufficient to account for this marvelous creation, of whose extraordinary wisdom the sciences have apprehended only a part; for this heat is more properly an *instrument* for the agent rather than the agent itself. This is self-evident from [the nature of] the natural heat in animate organisms; for it is an instrument used by the soul to perform its functions, as has been explained in the sciences. Similarly, it is clear that the proportioned heat by virtue of which a craft accomplishes its function is an instrument for this craft; it is not the craft itself. For example, an axe is not made from the proportioned heat involved in the craft without the craft [itself], i.e., from the concept of the axe in the soul of the artisan. Now, if all these activities of generation derived from the proportioned heat [in the semen], it would not be necessary to introduce a soul in animate creatures; rather the natural heat would be the form that perfects the existence of any existing plant or animal. But this is clearly absurd. In conclusion, it is evident, as Aristotle has pointed out, that

¹⁸ Averroes, *Long Commentary on Metaphysics, VII*: Arabic 883-84; Latin 181 F-L.

¹⁹ Aristotle, *Generation of Animals*, 743a 33, 767a 17. Averroes, *Commentarium de Generatione Animalium*, 76 E. *The heat in a living body must be the right amount; otherwise it will die either because of excess or of deficiency of this natural heat (Aristotle, On Breathing, 474a 25-474b 24. Averroes, Epitome of Parva Naturalia, Bk. III).*

whatever is potentially [something] becomes actually that thing by virtue of something actual that is similar to that which it has actualized. ²⁰

On the other hand, Averroes' claim that fire is generated from motion does not imply ^t that it is possible for the actualization ^u of some potential condition to come about from an agent that is not similar in actuality ^v with respect to the condition which was [initially] only potential. For, as Aristotle says, motion makes a higher degree of heat from a lower degree of heat in a thing that is heated. Now the heat is the agent in this activity, not the motion; the motion ^w is, however, an instrument in this process in so far as it brings the parts of the thing closer to each other, as Aristotle points out in his solution of this problem in his scientific treatises. Averroes has actually explained this point in his Commentary on Aristotle's *Meteorology* ²¹. It would then be not impossible for a stronger degree of heat to be generated from a lower degree of heat, just as from a low level of health in an ill person complete health is produced, as Aristotle mentions in the *Metaphysics*. ²² In this manner the hot object heats the thing that is being heated by being in contact with it; for in so far as the hot object works upon the thing that is heated by heating ^x it, the former makes the latter hot in actuality after it was [only] potentially hot. And if it does this job completely it makes the thing just as hot as it is, as Aristotle has pointed out in his scientific treatises. Hence, in this case, that which is generated is similar in some sense to that from which it is generated.

Furthermore, Averroes' contention that the quantity that accrues to a generated object is not brought about by means of some supervenient external quantity, and hence that it is not impossible for something to be generated from something unlike it, is sophistical. A thing that is generated may be generated essentially or accidentally. It is possible for something that is generated accidentally to be unlike its generator; but this is not possible in essential generation. For example, the building of a house is essentially derived from its plan conceived in the soul of the artisan, and it is similar in some respect to this concept. However, that which is generated accidentally in the house need not be similar [to that from which it is generated]. In fire, therefore, the lightness is not generated from something that is light, but the heat in it is generated from heat, whereas the lightness is consequent upon the heat.²³ Hence, its generation need not imply something similar to it. The same holds for a quantity that

²⁰ Aristotle, *Metaphysics*, VII:7, 1032a 24-25. Touati, *La Pensée*, 339.

²¹ Aristotle, *Meteorology*, I:3. Averroes, *Commentarium de Libris Meteorologicorum*, I, 404 I-405 A (This is the Middle Commentary). Touati, *La Pensée*, 337-38.

²² Aristotle, *Metaphysics*, VII: 7, 1032b 5 -1033a 22.

²³ For Gersonides, lightness is an accidental property of fire; heat is an essential property (*supra*, Bk. 5, pt. 3, chap. 2). Here too he disagrees with Averroes, for whom lightness is the substantial form of fire (Davidson, 215).

is generated. The quantity that is generated comes about in either of two ways: (1) the generated quantity in the recipient of the generation [results] from the rarity and density of the matter at the time of its reception of the generation; or (2) the generation of the quantity is the result of that which accrues to the organism by means of the nutritive process. Now the quantity generated as the result of the rarity and density of the matter is not a case of essential^y generation, but is the *consequent* [i.e., accident] of what has been generated essentially, and this is the tempered form, and it is the latter that is generated from something that is similar to it in some respect. The quantity of the matter, [however] is something consequent to it^z, since by virtue of the thickness and fineness of the matter, the matter is either rare or dense. Moreover, the quantity that accrues to that which is generated^{a1} is limited essentially by the form which it receives; so that the form is not found in something too small for it. Similarly, the quantity should be such that it is not too big for the form. This point has been demonstrated in the sciences. Now the quantity is consequent upon this form. Hence, nature does not begin a process of generation unless the appropriate amount of matter is present for the reception of that process of generation. Accordingly, one could say [to Averroes] that it is the form that is generated from something similar to it, and from it [i.e., the form] the generation of the quantity follows, since it is not possible for the form to be generated in a subject of any quantity whatever.

Similarly, the quantity that is generated from the nutritive process is also accidental generation. For what is generated essentially in this case -- i.e., the form of the flesh in so far as it has become [part] of the flesh and the form of the bone [in so far as^{b1} it has become [part] of [the bone -[comes] from something similar^{c1}.²⁴ Moreover, one could say^{d1} that the generated quantity is [generated] from something similar. This is evident in generation in the crafts. For just as the figure is generated from the figure in the soul of the artisan, so too^{e1} its magnitude is generated according to the magnitude [conceived] in the soul of the artisan; since he makes whatever figure he does make according to the size appropriate to the object that is to be made by that craft. For example, he does not make an axe *any* size but makes it the proper size in order that^{f1} its function can be accomplished.

Nor does Averroes' contention about motion establish the claim that it is possible for something to be generated essentially from something that is not similar in some respect. Qualitative motion, [for example], is

²⁴Aristotle *On Generation and Corruption*, I:5, 321b 18ff, 322a 2-3, 11-14. Averroes, *Middle Commentary and Epitome on Aristotle's On Generation and Corruption*, 115-16 (English), 103-04 (Hebrew).

-102-

[generated] from something similar, for it is entirely ^{g1} a composite of potentiality and actuality. Thus, whatever is generated from it is some kind of actuality belonging to the same [species or] genus as the last actuality, which is the end of the change. ²⁵And since the end of the change is [derived from] that which is similar [to it], the whole [process of the] change is [ultimately derivable] from that which is similar; only it emerges gradually. The same is true for the motion in generation; for the tempered form which is generated as the result of it is similar to that which occurs in qualitative change; it is generated from something similar, as has been explained. And that which is generated gradually ^{h1} from this motion with respect to its formation and figure, ²⁶ as in the case of the creation of an animal substance, is some kind of actuality similar to the total creation of that animate substance. This creation is not necessarily such that it is generated from something different from it in every respect. Rather, it is generated from something similar to it, as in the case of the crafts; for in the latter a figure is produced from a figure conceived in the soul of the craftsman. The same is true for the motion in growth ⁱ¹ as it is for motion in generation and qualitative motion; for it is quite evident from its nature that it derives from something similar. Indeed, those movements that do not issue in any other goal, as in the case ^{j1} of dancing to a song, also derive from something similar to them, i.e., the concept in the minds of the dancers pertaining to the motion of that song, so that according to the tempo of the song so is the tempo of the dance, as is obvious. Hence, it is evident that all these generated phenomena derive from things that are in some sense similar to them; and this point was implied by Aristotle. ²⁷Indeed, it appears that Averroes also maintained that all generated things derive from things that are in some sense similar to them; hence, he made an analogy between the soul-power in the

²⁵In the present context the phrase *po 'al' aharon* refers to the last state, or condition, to be realized in a process. This condition is the *end* of the change (*takhlit ha-shinui*), or the *terminus ad quem* of the change. The Hebrew phrase *takhlit ha-shinui* corresponds to Aristotle's phrase *τὸ τέλος τῆς μεταβολῆς* (Aristotle, *Physics*, VI:5, 236a 10. Wolfson, *Crescas' Critique of Aristotle*, 545, n. 13).

²⁶The manuscripts and printed editions have the reading



. Its usual connotation is "conception". But it can also mean shape or form (*Tosephta, Oholoth 14:10*), deriving from the verb *tzayyer* "to picture", "to draw". Since in this passage it is linked with *temunah*, the connotation of form seems more appropriate. This interpretation is supported by the phrase in Aristotle's *On Generation and Corruption*, I:5, *τὸν + ἄσχυ + μᾶτος καὶ τὸν + εἶδος* (321b 28). This is translated as "of its figure and form" (E.S. Forster in Loeb edition). Aristotle is discussing here the growth of flesh. In the Latin Averroes of *Generation of Animals* we find the same phrase: "*figuram et formam*" in the same context of generation by the seed (op. cit., 75H. Aristotle, *Generation of Animals*, I:22, 730b 14-15).

²⁷Aristotle, *Metaphysics*, VII: 7, 1032a 25 ff.

seed and the [concept of the] house in the soul of the builder, for the latter is in some sense similar to the house as actually made. We have, however, attempted to dissipate any doubts concerning those phenomena to which Averroes had referred and which it might be thought are generated from things dissimilar to them, so that there will be no difficulties with respect to the principle that everything which has been actualized from a state of potentiality is generated from [something] that is in actuality with respect to that genus. For this principle has been of great help in the discovery of the truth in many important problems, as is evident to anyone familiar with science and metaphysics.

Having established this point we want to maintain that it is evident^{kl} that the proportioned heat in the seeds and that which is similar to them deriving from the heavenly bodies are not sufficient [to account for] the generation of animate substances; just as it is not sufficient in the generation of things by some craft that makes a figure employing the proportioned heat by virtue of which the work is carried out, [to account for this by the heat alone]. For the heat is an instrument for the craft; it is not the craft itself. Thus, it is evident that there is a soul-power in seeds whose relationship to that which is generated is comparable to the relationship between the craft and that which has been made by that craft. Actually, Averroes has explicitly admitted this point, as would seem from what he says. Hence, he says that this proportioned heat comes from the divine rational skill, which is similar to the unity of form characteristic of the master-craft under which there are different crafts, all of which are subservient to the master-craft. One should not infer from Averroes' words that from this divine skill the proportioned heat alone is derived; rather he agrees that from this divine skill are derived the proportions and forms inherent in the seeds through which they [i.e., the seed and the heat] perform this activity, which is most orderly. Thus, Averroes maintained that these proportions and forms are exhibited in actuality in the First Mover in the same way as the existence of the artifact is present in actuality in the soul of the artisan. Hence, it is clear that Averroes agrees that this generation is ultimately traceable to a separate intellect, in whom these generated things are in some sense found in actuality. However, it would seem from his words that he also suggests that this activity is derived from this First Mover in so far as there emanates from the latter, by means of the proportioned heat, a natural soul-power which performs its activity in a most orderly fashion, although it is not intelligent. This is the soul that Aristotle though emanates from the sun and the inclined sphere. The situation here is similar to the situation in the activities of an animate substance with respect to growth and nutrition: it performs these functions in the most orderly fashion without nature knowing what it does. And just as the agent in a case of partial

generation [e.g., the generation involved in digestion] is a corporeal soulpower, so it is in the case of a total generation, i.e., the generation is accomplished by means of a corporeal soul-power inherent in the seeds or in what is similar to them [in animals that do not have seeds]. ²⁸

However, in his commentary to Book VII of the *Metaphysics*, it would seem that Averroes maintains that this soul^{ll}-power in the seeds is a separate substance. Thus, he says that all of those powers [in the seed] are natural divine powers that generate their like just as artisans make their products. ²⁹ He also says that these powers are similar to an intellect in so far as they do not employ a corporeal organ when they are making the form and figure [of the organism]. Moreover, he says that this power functions only by means of the heat in the seed, but it is not a form, as is the soul that is the form in the natural heat; rather this power is bound up with it [i.e., the seed], just as the soul is bound up with the heavenly bodies. All of this would seem to suggest that this power is a separate [substance]; for it is one of the features of a separate

[substance] that it performs its functions without a corporeal instrument and that it does not inhere in matter, as Averroes does say about this power in the seed. Nevertheless, he does not explicitly allow the inference that this generating power is a separate [substance]. He was led to this conclusion because he believed that since this power employs in its activities *some* kind of instrument, [i.e.,] ^{m1} the heat in the seeds, it would follow from this that it is not a separate substance in so far as it employs an instrument [even] to *some* extent. He says this explicitly in his commentary on Book XII of the *Metaphysics*. ³⁰

Now this claim is not true, as we have shown in Bk.1, chap. 6. For, if a separate [substance] performs some activity upon something else, it necessarily uses some instrument. This instrument is that by virtue of which the matter is prepared to receive the volition of the separate substance. In conclusion, no matter how and what this [process is like], it is clear that [even] Averroes would agree that this process of generation is ultimately traceable to a separate power which is an intellect and he agrees that [this power] is in some sense similar in form to what results from this process of generation. This ⁿ¹ intellect is, according to Averroes, the First Mover. He did not endeavor to deny in this treatise that this generation is traceable to a separate power; rather he rejected the thesis that there are separate forms generating their like in the manner suggested by

²⁸ Averroes, *Long Commentary on the Metaphysics, XII*, Arabic 1505; Latin 305A-F. Genequand, 112. Aristotle, *Generation of Animals, II:3*, 736b 30-737a [7](#).

²⁹ Averroes, *Long Commentary on the Metaphysics, VII*, Arabic 884; Latin 181E. *Middle Commentary on the Metaphysics*, (Hebrew), Vatican #336, Book VII, folios 113-14.

³⁰ Averroes, *Long Commentary on the Metaphysics, XII*, Arabic 1505; Latin 305 B-C. Davidson, [217 - 18](#).

Plato. ³¹ On this point he disagreed with Themistius; for Themistius employed these arguments in support of the Platonic [version of the] thesis that there exist separate forms, [whereas] Averroes wanted ^{o1} to refute these arguments. This is evident from Themistius' discussion in his commentary on Aristotle's *Metaphysics*, Book XII. ³²

Nevertheless, there is considerable difficulty and confusion concerning the question whether or not this activity of a separate generator ^{p1} takes place via another corporeal form in the seed besides its natural heat. We shall consider this question later ^{q1}. Averroes seems to agree that the separate generator does employ a corporeal form that is in the seed. However, ibn Bajja [i.e., Avempace] believes that this agent does not use an intermediary; hence he maintains that the agent involved in the generation from seeds is a power that is enmeshed in the seed, i.e., an intellect. This is what Averroes relates of [Avempace's position]. ³³

Indeed, Themistius' third argument also suggests that this generation is traceable to a separate agent that is an intellect. It is in consequence of this fact that this creation occurs so perfectly, such that men have tired in trying to understand only a bit of this perfection. Now this [argument] implies that [this process] is ordered by [for emanates from] one agent that understands the goal [of this process]; but it does not follow either that it proceeds without an intermediary or that it proceeds via an intermediary. One could say that this [process] is ordered by the agent by means of a soul-power in the seed emanating from the agent, and that this power directs [the process] towards the goal without knowing about it, just as the power of nutrition and growth directs its process towards its intended goal in the best manner possible without apprehending this process. Nevertheless, this activity emanates to this [power] from a separate

agent that generates the power. This is similar to the situation in the crafts in which instruments are employed to accomplish a goal, yet these instruments do not apprehend [what they do]; rather [they accomplish their activities] because the artisan has arranged them in such a way so as to perform this activity. An example of this would be the millstone: they have instruments which move them with circular motion without their understanding this [process]. However, the artisan who endowed the millstone with these instruments does understand this process. It is evident, however, that from this argument it does not follow that there are two agents for one process of generation: one which prepares the

³¹Averroes, *Ibid.*, Arabic 1495 ff; Latin 303 E-F. Genequand, *Ibn Rushd's Metaphysics*, 107 ff.

³²S. Pines, *Some Distinctive Metaphysical Conceptions in Themistius...*, 189.

³³Averroes, *Commentarium de Generatione Animalium, II*, 75 K-M. Abraham Shalom, *Neve Shalom VII*, pt. 3, C. 73. Davidson, 204-06, 212-13.

-106-

matter to receive the form, the other which gives the form, a view that Averroes attributes to some ancient philosophers. It would seem from Themistius' formulation of this argument that he did not understand this [kind of] generation in the way that Averroes understood the view of some of the commentators who came before him. ³⁴

Moreover, we maintain that the arguments in behalf of Averroes' position do not entail that this process is not ordered by an intellect, either via some power or without an intermediary. For the first of these arguments clearly does not imply that this generation is not traceable to a separate agent. Rather, it implies that it is impossible for one process to have two agents, one [supposedly] preparing the matter to receive the form, the other [supposedly] generating the form. However, if it is maintained that every process of generation is ordered by a separate agent by means of the natural heat in the generated substance or by means of the soul-power in it -- just as the artisan produces a form ^{r1} in matter by means of the pre-disposition of the matter to receive his volition --, then the absurdity [suggested by Averroes] does not follow. Indeed, this is evident in the second, fifth, sixth, and seventh arguments we have mentioned by Averroes in behalf of his position. For all that these arguments establish is the impossibility of two agents for one process: one for generating the form, the other for preparing the matter to receive the form. They do not prove that this process is not traceable to a separate agent. This is evident to anyone who examines these arguments.

The third of Averroes' arguments in behalf of his position claims that it is impossible for a separate form to generate a form in matter among animate substances; for this form that generates animate substances does so by means of some instrument, i.e., the soul-heat in the seed or by means of something corresponding to it in things that are generated without seeds; and whatever satisfies this condition is obviously not a separate [agent]. ³⁵ Nevertheless, even if we were to admit this [latter] principle, it would obviously not follow that this process is not traceable to a separate agent. But what does follow is that the proximate agent of the generation is corporeal; for it performs its activity by means of an instrument. Yet it is possible that the proximate agent in generation itself be generated by a separate agent as Averroes himself admits in his commentary on the *Book of Animals*: i.e., the agent of this soul-power in the

³⁴In this remark, Gersonides seems to be trying to rescue Themistius, with whose general view he is in sympathy, from the criticisms of Averroes. The factor that is primarily responsible for generation is the Agent Intellect -- on this both Themistius and Gersonides agree. That which

is responsible for preparing the matter is not an agent at all, but some kind of instrument.
³⁵Averroes, *Commentarium de Generatione Animalium*, II, 75 K.

-107-

seed is a separate [agent], since it performs this activity without an instrument. ³⁶Moreover, in Bk. 1, chap. 6, of this treatise we have demonstrated that this process does not entail that this power be corporeal. For a separate agent exhibits two kinds of activities: (1) self-knowledge, which activity necessarily dispenses with an instrument; and (2) the ^{s1} emanation from it of some of the actions or affections of bodies, and this can involve an instrument of some kind. It is by virtue of this instrument that the matter is prepared to receive the volition of the separate agent. For the motion that is derived from the movers of the heavenly bodies ^{t1} to these bodies which are moved by them involves an instrument; this instrument is the shape possessed by the heavenly bodies without which they would not have the movements that we observe. Moreover, the nature that they possess [i.e., the aethereal element] is also an instrument. For these bodies are neither light nor heavy, as has been demonstrated in the sciences; if they were either light or heavy, their continuous, circular motion would be impossible. ³⁷Now, Aristotle has demonstrated that these movers are separate; indeed, we shall prove this later. And since they move the heavenly bodies by means of an instrument of some sort (as I have explained), it is evident that it is not impossible for a separate agent to employ an instrument in some sense.

This can be proved in a different manner; i.e., that a separate agent can operate on bodies by means of an instrument. For the activities which emanate from the movers of the heavenly bodies upon the sublunar domain are [in fact] mediated through an instrument, which is the star or planet [itself]. Hence, it is clear that it is not impossible that the agent in generation be separate, although it uses an instrument of some kind. This is the instrument through which the matter is prepared to receive the volition of the separate agent.

Nor is Averroes' fourth argument valid. It maintains that the claim that in generation the agent is a separate intellect similar in some respect to the corporeal forms generated from it is analogous to Plato's theory of the Forms. It is evident from [an examination of] the various absurdities to which the Platonic theory is open that the [present] theory is not subject to any of these difficulties; i.e., if we maintain that these forms are present in the mind of the generator in the same way as the forms generated by means of some craft are in the soul of the craftsman. We have already suggested a proof of this in Bk. 1, chap. 6 of this treatise. Moreover, Averroes himself admits that the intelligible order in the soul of the First Mover is the cause of the observable order in the sub-lunar world. Thus he says that all the proportions and forms are in some sense

³⁶Ibid., 76 C. Davidson, 214.

³⁷Aristotle, *On the Heavens*, I, *passim*; *Physics*, VIII: 8-9.

-108-

actually present in the First Mover, in the same way as the existence of the product is in the soul of the artisan. ³⁸

Furthermore, with respect to each one of the movers of the heavenly spheres, Averroes completely concedes this point, as can be seen in his commentary upon Book XII of the *Metaphysics*. He presents there the following argument:

"The heavenly bodies move because they understand by themselves [i.e., through their souls] that their perfection is motion, just as a moving [organism] knows to preserve its health and [knows] that the preservation of its health is through motion. Moreover, the heavenly bodies understand that their motion is for the purpose of bringing that which is potential in those ^{w1} separate forms into actuality, i.e., the material forms. For it would seem that these forms [i.e., the material forms] have two [kinds] of being: being in actuality, i.e., existence in matter, and being in potentiality, i.e., existence in those [i.e., separate] forms. By "potentiality" I mean the way in which the forms of artifacts have actual being in matter and potential being in the soul of the artisan. This seems to show that these forms have two [kinds] of being: separate being and being in matter. The separate [kind of being] is the cause of the being in matter. This is the point that the believers in Forms [i.e., the Platonists] were attempting to establish, but they failed." ³⁹

Now from this statement it can be shown demonstratively and convincingly that, according to Averroes, generation is ultimately traceable to a separate agent in which are present in some sense all the material forms, -- i.e., in the same way in which the forms of artifacts are in the soul of the artisan, -- and that this view is not identical with the doctrine of the Platonists. On the other hand, Averroes' statement that these forms exist potentially in the separate forms does *not* mean that these forms do not have actual existence in any sense in the separate forms; [for such actual existence is in fact] the intelligible order that they [i.e., like separate forms] possess. What he means is that these forms do not exist *materially* in the separate forms except potentially, just as the material forms in artifacts do not exist in the soul of the artisan except potentially. However, what exists actually of them in the soul of the artisan is their intelligible order [as conceived by the artisan]. This is quite clear from Averroes' discussion.

Averroes' eighth argument, however, is very obscure and perplexing. It maintains that if a material form is generated from a separate form, one [act] of generation would derive from many agents; for separate

³⁸ Averroes, *Long Commentary on the Metaphysics*, XII, Arabic 1505; Latin 305 A-E. Genequand, *Ibn Rushd's Metaphysics*, [112](#).

³⁹ Averroes, *Ibid.*, XII, Arabic, 1595-1596; *Latin 318 L-M*. Genequand, [149](#) - [50](#).

forms [as such] cannot be united, as they can be when they are [embedded] in matter. ⁴⁰ Upon closer examination, however, it will be seen that the contrary is the case; i.e., the unity of the separate forms [as such] is more perfect than it is as [embodied] in corporeal forms. This will be made clear after we lay down [as a general principle] that it is necessary that [this] unity be perfected through the *conception* of [these] material forms. This is evident from the following. The intelligible order in the soul of the artisan of an artifact to be made, in which there are [a number of] forms, [is such that] these forms are [hierarchically] arranged according to their [relative] perfection, as is the case, [for example], in the form of the house as [conceived] in the soul of the builder. For the shape of the stones and bricks is related as matter for [forms] of the walls and of the doors; the latter forms serve as matter for the forms of the rooms, courtyards ^{x1} and the other parts of the house, which in turn serve as matter for the form of the house as a whole. Now, since this order in the soul of the builder is necessarily separate, as Aristotle says in *On the Soul*, the knower and the object of knowledge are numerically one. ⁴¹ If these forms were not united in the soul of the artisan, I would find it puzzling how the builder could make some of these forms subordinate to others. Would it be possible for me to make that which I conceive so that what you conceive results without my having an idea of what [you have conceived]? This would be utterly absurd. For how can I accomplish in the most orderly manner possible the

purpose that you have conceived, if I have not conceived of this purpose? If this does occur, it does so by chance; but this does not occur among things that are frequent, as in the case of things generated by craft or by nature.

This can also be demonstrated from the case^{y1} of the acquired intellect. Its objects of knowledge are many; nevertheless, it is necessarily numerically one because it is the perfection of one^{z1} [individual], and whatever is a perfection of something that is numerically one is itself

⁴⁰Averroes' eighth argument against the Themistian position that in sub-lunar generation a separate, incorporeal substance is necessarily involved claims that if the Themistius' thesis were granted, there would be many such separate agents for *one* act of generation. For, in any given case of a terrestrial generation, the generated substance exhibits and embodies several forms that are hierarchically ordered as a unity in the material substratum, which serves to individuate the entity. Now, if it is postulated that in this process of generation, a separate agent is involved to generate the material form, there would have to be many such agents, corresponding to the plurality of forms produced in the material substratum. But unlike the latter forms, the separate forms as such have no substratum wherein and whereby they are ordered into a unity. Thus, they would be many and disparate.

⁴¹Aristotle, *On the Soul*, III:4-5; *Metaphysics*, XII:9.

necessarily numerically one, as we have indicated in Bk.1. ⁴²Moreover, we observe that a man [can] compare [or relate] some of these objects of knowledge to others. Now, if the acquired intellect were not one, this would not be possible. For I cannot relate my knowledge to your knowledge that is unknown to me. ⁴³Now, it is possible for the objects of knowledge to be all unified, for they are [hierarchically arranged] such that some are subordinate to others, [whereas] some are the perfections of others. And that which is the perfection of something and that which is perfected belong to one piece of knowledge, for they are correlative, and correlatives belong to one piece of knowledge. ⁴⁴This would seem to show that the unification in the acquired intellect is achieved through the knowledge of all the material forms of which the prime matter is receptive. Now if this is possible for the acquired intellect, from which are hidden many things that make this intelligible order unified [as has been explained in Bk.1], all the more so is this unification possible in the soul of the separate agent responsible for generation, in which nothing is unknown of [those] things that make this order one, as has been explained in Bk.1. ⁴⁵In conclusion, then, it is evident ^{a2} that these cognized forms are unified in the mind of the knower. For since the order of existent things is a unity, it is necessarily ^{b2} the effect of *one* intellect. And it would be absurd for it to be an effect of this intellect in this marvelous way and the intellect not apprehend its own effect in some way.

Accordingly, Aristotle agreed that God knows all the objects of knowledge but that He apprehends them together, [i.e., simultaneously], not successively; He apprehends them simultaneously in so far as they in their entirety are in Him as one order. He says this in the *Metaphysics*, Book XII:

"In whatever has no element [the act of thinking and the object of thought] are one, since the intellect and the act of thinking are also one. It remains for us to consider whether the object of thought is composite. [If it is composite], then it would be like when [thought passes from part to] part of the whole. Or [perhaps] it is indivisible, [as is] anything that has no element [i.e., matter], as [for example] the human intellect. [On the other hand], with respect to [the

⁴²Gersonides, *The Wars of the Lord*, vol. 1, Bk. 1, chap. 13.

⁴³If the intellect were not a unity, then in relating or comparing concepts we could be in a situation comparable to comparing concepts that are unknown to us. A mind lacking unity is analogous to several minds, each ignorant of the contents of the other. This argument anticipates Kant's idea of the unity of apperception (I. Kant, *Die Critique of Pure Reason*, A [103 - 130](#)).

⁴⁴Aristotle, *Categories*, VII, 8a 35-8b 14.

⁴⁵Gersonides, *The Wars*, vol. 1, Bk. 1, chap. 12.

-111-

thought] of composites [the thought consists of] parts corresponding to the nature ^{c2} of [the object of thought]. But the best of this is that which is a whole and this is one thing. And in this case, the act of thinking (is concerned] with itself throughout all time." ⁴⁶

Here is our interpretation of this passage. Since it was Aristotle's intention to prove that the First Intellect is absolutely one and simple, he proved first that the knower, the act of knowing and that which is known by it are numerically one; hence, in this respect there would be no plurality in the First Intellect. For in whatever has no element the knower, the act of knowing and the object of knowledge are numerically one. However, in whatever has an element [i.e., a composite] the object of knowledge and the act of knowing are different; all the more so is the object of knowledge different from the knower. For example, the color in the seen object is different from the color that is in the visual faculty of the perceiver, which is the act of [visual] apprehension; all the more so is it different from the visual faculty [itself]. On the other hand, in that which has no element it is not possible for the knower to be different from the act of knowing or from that which is known, as has been explained in Bk.1. ⁴⁷

When Aristotle succeeded in demonstrating ^{d2} in this way that there is no plurality in God in this respect, he then attempted to prove that there is no plurality in God by virtue of the fact that the object of knowledge is itself composite. Thus, he says that it remains to be considered whether the object of God's knowledge is composite, as it would seem from the order in the world deriving from Him. [If it were composite], it would then be divisible, just as the parts of a whole [are divisible]; i.e., the objects of His knowledge would be many and divisible, as is the case

⁴⁶I have translated this passage from *Metaphysics*, XII:9, 1075 a 1-11, as it appears in the text of Gersonides, supplementing it with certain transitional phrases and providing subject antecedents wherever necessary. As the subsequent discussion will reveal, the passage is extremely difficult. Indeed, even the English translations of Aristotle differ considerably in their interpretations of Aristotle's meaning in this discussion. A comparison amongst the Ross (Oxford translation), Tredennick (Loeb), Wheelwright (Odyssey), and Hope (University of Michigan) translations is illuminating. Both this passage and the corresponding citation from Averroes that will be subsequently quoted and discussed differ in some important respects from the original Greek. This is especially the case in lines 1075a [7 - 9](#), where in the Greek there is an explicit reference to the role of time in knowledge, which is completely missing in the Hebrew except for the last word in the passage. This is particularly surprising, since Gersonides introduces this passage to illustrate the difference between the simultaneous apprehension of God and the successive apprehension of men. This contrast, however, gets lost in the subsequent development of the argument. I have tried to translate this quotation as literally as possible without making it favor any one interpretation.

⁴⁷Gersonides, *The Wars*, vol. 1, Bk. 1, chap. 13.

with the many parts of a whole, by virtue of which the whole would be multiple in some sense. Thus, there would be a plurality in the essence of the First Intellect. But this is obviously absurd. [Aristotle then suggests as an alternative that] perhaps we should say that this object of knowledge is *indivisible* and hence there is no plurality in God in this respect; for whatever has no element is not divisible, as is the case with the human intellect. That is, although its knowledge is in some sense multiple, the human intellect is one and simple, i.e., indivisible, as we have shown in our preceding discussion in this chapter and in [chap. 13 of] of Bk. 1.

Concerning [the thought of] composites with respect to their order and perfection, it is of this sort^{e2}: it is in some sense divisible with respect to degrees of perfection. Thus, in the parts of their definitions there is in some sense plurality. Indeed, this is So^{f2} since they [i.e., the definitions] have elements.⁴⁸ [Aristotle's claim that] the best of this is that which is a whole and that this is one thing [should be construed] as follows: the best thing here is the thing that encompasses the whole order and rightness of existent things, and this is a thing that is numerically one, i.e., God. This is indeed possible in His case because He has no element; [i.e., God is incorporeal and simple]. Since it has already been proven that in God the intellect and the intelligible object are one, the intellect of God has itself [as an object of thought] in such a way that it encompasses the order of all existent things all the time.⁴⁹ This is our interpretation of this passage; it agrees with the meaning of Aristotle's text as well as with the truth itself.⁵⁰

Averroes'; interpretation of this passage, however, disagrees with the language of Aristotle. This is what he says:

"It remains to consider whether the object of thought is composite; [if it is], thought^{g2} would change [when passing from] one part of the whole to another part'. This passage is to be construed as follows. There remains a doubt with respect to that which is apprehended by God, whether it is simple or a composite of many objects of knowledge. If it is a composite of many objects of knowledge, then it will necessarily consist of parts different from another.

⁴⁸The definition contains the concepts of the genus and of the specific difference, both of which are *parts* or elements, of the definition (Aristotle, *Metaphysics*, VII:10, 1034b 20).

⁴⁹According to Aristotle, God is continually thinking of Himself. The medievals added the idea that in thinking of Himself He is thinking of the universe in so far as the plan of the universe is a concept in His mind (Aristotle, *Metaphysics*, XII:7 and 9. Gersonides, *The Wars of the Lord*, volume 1, Bk. 1, chap. 11; vol. 2, Bk. 3, chap. 1).

⁵⁰Thomas Aquinas, *Commentary on the Metaphysics of Aristotle*, (Chicago, 1961), vol. II, Book XII, Lesson 11, Par. 2623-2625, 916. Gersonides' interpretation of this passage is close to the interpretation given by L. Elders (L. Elders, *Aristotle's Theology*, Assen, 1972, 267).

If this is so, then God would apprehend many things; and whatever apprehends many things apprehends something external to itself. [In fact, these objects of knowledge would be the cause of God Himself. And when Aristotle says, 'whatever is without any element is indivisible, just as the material [i.e., human] intellect', he could mean the following. Any intellect whose object of knowledge is such that it has no element, i.e., an intellect in whom the intellect and the object of knowledge are identical, is necessarily indivisible. In the human intellect division is possible because the cause of division here is the object of knowledge, which is in some sense different from the intellect. For, if the intellect and its object were identical in every respect, there would

be no multiplicity in its objects of knowledge, since the cause of multiplicity is the [very] difference between the intellect and its object of knowledge. It is probable that Aristotle means that the proof of [the proposition that] in whatever is without an element the object of knowledge is not different from it [i.e., the intellect] is [taken from] the human intellect. We see that whatever the latter abstracts from matter, even if it is not absolutely free [from matter], the intellect and the object of knowledge are identical. Accordingly, if something is abstracted from matter completely, the identity between the intellect and its object is absolute.

With respect to the phrase '[the thought] of composite particulars of this [sort] and according to this species', Aristotle means the following. Composite substances surpass each other with respect to their minimal degree of compositeness and proximity to the first simple being in their [respective] genera. That is, if there is some genus of intelligible objects ⁵¹ such that one part surpasses the other parts in compositeness, i.e., with respect to the differentiation between the intellect and its object, the most superior amongst them is the one in which there is the least compositeness in that genus; indeed it is the simplest in that genus. And having said that superiority in a species means superiority with respect to minimal compositeness, Aristotle went on to say, 'the best in some thing, however, is the ⁵² whole, and it is one thing'. ⁵² This means that the most perfect thing in any genus is necessarily whole and simple, i.e., indivisible. Such a thing is ⁵² separable per se and noncomposite, i.e., it exhibits no composition. For example, hot things

⁵¹The manuscripts and printed editions read:



The underlined phrase is difficult. Averroes' original Arabic has: jins min al-'uqūl, "a genus of intellects"; however, Bouyges records an alternative reading: jins min al-ma'qĒBI, "a genus of intelligible", (p. 196). The Latin translation follows Bouyges' reading: aliquod intelligentiarum (336 I). The Hebrew Averroes has



" a [or 'some'] genus of intelligible object". But the term



can be written differently such that



results, is what we have in Gersonides. The latter phrase is equivalent to: "some intelligible genus". Since Gersonides used the Hebrew version of Averroes, we should follow that reading at least as far as adopting



ma'qūl, instead of Bouyges choice of 'uqūl. Both



(Gersonides) and



, (Hebrew Averroes) make philosophical sense in this context. However, I have chosen



to bring Gersonides' text closer to the Hebrew Averroes.

⁵²Bouyges' text has: wahuwa shay' akhar', "and it is something else". However, Bouyges notes

that the Hebrew version has



"one."

-114-

surpass each other in their degrees of heat. Thus, an absolutely hot thing has no composition; and this is the [simple] element of fire, since no other body [i.e., an element] is mixed with it by virtue of which the heat^{j2} is diminished [in it]. Similarly, the First Intellect is necessarily simple and absolutely one.

[When] Aristotle says, 'In this manner the act of thought is of itself throughout all time', he means that it does not apprehend anything external to itself, since it is simple, and that its apprehension of itself is eternal. Nor do we fear that any weariness will take place in the First Intellect, as^{k2} does occur in the human intellect. This is also the case in the other separate intelligences, but the First is the most simple among them. Hence, that which is absolutely one is something in which there is no multiplicity in any way, neither with respect to a difference between the intellect and that which is known, nor with respect to a multiplicity within the object of knowledge. For multiplicity in the objects of knowledge in one and the same intellect, as in the case of the intellects in us^{l2}, results from the distinction between the intellect and its object; since when the intellect and its objects are perfectly united, the *many* objects of knowledge of that intellect are necessarily united. That intellect becomes one and simple in every respect; for if the objects of knowledge that are acquired by one intellect remain many, the intellect itself will not be unified, since it is different from them. This point eluded Themistius when he maintained that the intellect apprehends many objects of knowledge at once. This contradicts our claim that the [First] Intellect apprehends itself and not something external to it and that the intellect and its object are one in every respect. Themistius maintains that the [First] Intellect apprehends all things in so far as it knows that it is the principle, [or cause] of them. All of this^{m2} is characteristic of the kind of doctrine advanced by someone who does not understand the proofs of Aristotle.⁵³

However, there is here a problem: God would be ignorant of sublunar phenomena [if He knows only Himself]. Accordingly, some

⁵³Themistius, *Paraphrase on Metaphysics*, XII:9, 26-29 (Hebrew), 30-34 (Latin).

-115-

people were forcedⁿ² to say that God knows such phenomena only by means of a universal cognition, not by a particular cognition. The truth is, however, that in so far as God knows Himself only He knows all existing things through the existence [i.e. His own] that is the cause of their existence. For example, we would not say that someone who knows the heat of fire only [i.e., the essential element of fire], has no knowledge of the nature of heat found in hot things; rather what he knows of this nature of heat is heat as such [be-muhlat]. Analogously, the First (may He be praised) knows the nature of that which exists in so far as it exists as such, which is His very essence^{o2}. Hence, the term 'knowledge' is predicated of divine and human knowledge equivocally; for His knowledge is the cause of that which exists, whereas that which exists is the cause of our knowledge. Accordingly, divine knowledge is describable neither as universal nor as particular. For someone who has universal knowledge knows the particular things which exist [only] potentially; his knowledge is necessarily knowledge in potentiality^{p2}, since the universal is [only] the knowledge of particular things. Now if the universal is knowledge in potentiality,

and since there is not potentiality in God, His knowledge is not universal. It is even more clear that God's knowledge is not particular, since particulars are infinite and cannot be encompassed by knowledge. Hence, divine knowledge cannot be described in terms of human knowledge or ignorance, its contrary, just as one does not describe something by a predicate or its privation if it is not of the nature to have either. Thus, the existence of a being has been proven who cannot be described in terms of human knowledge; nor is there any differentiation between its existence and its knowledge."

This is the argument of Averroes. ⁵⁴

Since it has been thought that from Averroes' statement it can be inferred that God does not know anything at all about the law and order obtaining in the sub-lunar world, -- and this is an inference which follows from what has been just [stated in his behalf], -- we believe that it was proper to cite Averroes' statement and to investigate whether or not it is correct. Now it is evident that if this is his understanding of this topic, his interpretation departs from the language of Aristotle. Aristotle himself says: "But the most perfect in this is that which is a whole [ma shehu kol] and this is one thing." But if there is no multiplicity in some sense in that which is known by [the divine mind], it would not be pos-

⁵⁴Averroes, *Long Commentary on Metaphysics, XII*, Arabic 1703-1708; Latin, 226 E-337 C. (Latin). Genequand, [196](#) - [98](#). Touati, *La Pensée*, [137](#), especially n. [38](#).

-116-

sible to use the term 'whole.' ⁵⁵Hence, it is clear that Aristotle believed that God knows the law of existent things as a totality, and in this way He is the cause of this totality, just as the law that is in the mind of the general is the cause of the order obtaining in the army, as Aristotle says in the subsequent chapter. ⁵⁶Aristotle has proven that no multiplicity in the First Intellect results from [this knowledge], since in God there is no element, [i.e. matter], whereas the multiplicity obtaining in the order of the sub-lunar world is because of the element, as has been demonstrated. Now in his commentary Averroes has changed the term 'whole' and has replaced it with the term 'simple'. Thus, he was inclined to say that God's knowledge of things is like the case where [if] someone knew the heat of fire he would already know the nature of heat in hot things. Now it is evident that the heat in fire is heat in the maximum degree ⁹², since it is simple and not mixed with cold; hence,, it is possible to say of it that it is *all* the heat [kol ha-hom].

It would seem that it was in this way that Averroes construed the term 'whole' [koll in Aristotle's statement. But this interpretation is valid only for objects that are in some sense divisible, as the heat of fire, which is divisible when mixed [with something else], such that there are some quantities of heat ^{r2} that are twice as great as other quantities. ⁵⁷Thus, it follows that in the object of knowledge in God there is some multiplicity. Averroes himself already has admitted as much, as we have mentioned; for he says that all the proportions and forms are in every respect present in actuality in the First Mover, analogous to the way the existence of an actual product exists in the soul of the artisan. I do not know whether Averroes has contradicted himself here; or whether his meaning in this context is that God knows the law, order, and rightness of existent things in so far as it is one in Him, which is in fact the truth. I think that Averroes' intention in this statement [quoted above] is that God knows the intelligible order of the world, which is the cause of the observable order in the world, but that God does not acquire this knowledge from existent things; rather, the reverse is true, i.e., existent things acquire their being from the intelligible order concerning them in the soul of God, just as the forms of artifacts derive their existence from the intelligible order in the soul of the artisan.

On the other hand,, the question whether or not God knows that something has emanated from Him to existent things requires some examination. Themistius believes that God knows that something has

⁵⁵ A whole implies parts.

⁵⁶ Aristotle, *Metaphysics*, *XII*: 10, beginning.

⁵⁷ Averroes wants to maintain that in some sense God knows particulars, but He knows them by knowing Himself, and that there is no multiplicity in God's knowledge since God is simple. Now according to Aristotle, the first or maximum in a genus or species can be said to be the cause of that genus, (Aristotle, *Metaphysics*, *II*:1, 993b 25) and conversely. Thus, fire, which is the hottest of all hot things is the cause of hot things. Averroes construes the priority of the cause or maximum as simplicity. Thus, fire is simply heat. By analogy, he then goes on to say that since God is the cause of all things He is simple; hence God's knowledge is simple.

Gersonides rejects this analogy. Fire is simple in a way different from the simplicity of God. Someone who knows the nature of fire knows thereby the nature of heat in other hot things, since the latter are hot by virtue of the element of fire which enters into these hot compounds. Fire, then, can become compound. However, in knowing Himself God knows a nature that does not enter into other substances as an element. God is, therefore, always simple, although there is an aspect of multiplicity in the object of His knowledge, i.e., the order of the universe as a system of many entities.

-117-

emanated from Him in so far as He is its cause. Averroes believes that God does not know [that something has emanated from Him], since, from what can be inferred from Aristotle's discussion, God knows only Himself. We maintain, however, that God knows that which emanates from Him in so far as it is [in some sense an aspect of] Himself, and this aspect is the most superior feature of His being; i.e., in so far as it has acquired [its being] from the law and order in the soul of God. If that which emanated from God were in every respect alien to that which is known by Him [i.e., the intelligible order], it would not be fitting for God to know it. Since, however, that which He apprehends [i.e., the plan of the universe] is in some way similar to that which emanates from Him, it is evident that in this sense He knows what emanates from Him. Moreover, since the cause and that of which it is the cause are correlatives, and correlatives are part of one cognition, it follows that God has some knowledge of that of which He is the cause. Again, since God knows himself perfectly, it is fitting that He not be unaware that something has emanated from Him; otherwise ^{s2} His self-knowledge would be defective. Furthermore, it is utterly false [to claim] that something has emanated from Him in the most perfect manner possible for the attainment of its intended goal *and* that God did not intend it or have knowledge of it. This might be possible in the subsidiary crafts; but it is not possible in the master-craft.

Indeed, it is possible for God to have knowledge of that which emanates from Him by virtue of His self-knowledge, since that which emanates from Him is similar in some sense to His essence, just as the order in artifacts is similar to the order in the soul of the artisan. Hence, Averroes was right in saying ^{t2} (in his commentary on Book XII of the *Metaphysics*) that God knows the most perfect aspect of the being of existent things, whereas they exist [in themselves] in an imperfect manner. ⁵⁸ But that which Averroes says concerning the intellect and the object of knowledge -- that they are not numerically one in man ⁵⁹ -- assumes ^{u2}

⁵⁸Averroes, *Long Commentary on Metaphysics, XII*, Arabic 1708 (Genequand, 197).

⁵⁹Ibid., 1704 (Genequand, [196](#)).

-118-

that human knowledge is the cognition of universals. We have dealt with this point in our rejection of Averroes' doctrine in Bk. 1 of our treatise. ⁶⁰Thus, it is clear that human knowledge [too] is neither of universals nor of particulars ^{v2}; rather it is of the intelligible nature of things that is present in the soul of the agent of these things, as we have shown in Bk.1. Hence, there is no difference in this sense between human and divine knowledge.

In fact, it is quite clear that Aristotle's view was that God knows the law and order of existent things, as is evident from what he says in the next chapter of Book XII [of the *Metaphysics*]. This is what he says there.

"Let us consider how in the nature of the whole the good and the best [are exhibited]. Is it something separate and by itself; or does it [consist] in the order [of the parts]? Or in both ways, like an army. For its good is in the good order and in the general, and in the latter more, since he is not [a general] by reason of the order; rather he is the cause of the order. In some way all things are ordered together in nature, but not all alike -- [there are] fishes, birds, and plants." ⁶¹

We shall now explain this passage.

"Let us consider how in the nature of the whole the good and the best [are exhibited]"; this is the order and rightness inherent in the universe. "Is it something separate and by itself, distinct from other things?" That is, is the good manifested in God only, just as the good exists in the goal for the sake of which everything else [exists]? This is absurd; for the good is manifested in each and every thing, although in some things the good is greater than in others. Or, should we say that this good is found in the things in the world in so far as they exhibit order and rightness without there being an order existing by itself from which the order in the world ^{w2} [presumably] emanates? But this too is false, as we have explained before. For the marvelous creations exhibited in the world cannot [be explained] except by introducing an agent that understands and intends the goal [for which they have been created]. "Or, should we say that [this good is exhibited] in both ways, as in an army." For in an army the good is present in two ways: (1) in the order exhibited in the activities that are arranged in the best manner possible; and (2) in the good in the general from whom this good [i.e., the order] in the army derived. Now the good present in the general is more perfect; for the general does not exist in the army ^{x2} by reason of the order, but the order

⁶⁰Gersonides, *The Wars*, vol. 1, Bk. 1, chap. 10. According to Aristotle and Averroes human knowledge is of universals (Aristotle, *On the Soul*, II:5, 417b22-24).

⁶¹Aristotle, *Metaphysics*, XII:10, 1075a 12-17. Averroes, *Long Commentary on the Metaphysics*, XII, Arabic 1709- 1710. Genequand, 198-99.

-119-

in the army exists by reason of the general. Or, perhaps in saying "[it resides] more in this" Aristotle was referring to the good and best in existent things. And he meant thereby that in so far ^{y2} as God is [in fact] the ruler of the whole universe this good is found in a higher degree than the good present in the army led by the general. For God does not exist by reason of the order obtaining in the world; rather this order exists [solely] by reason of the order existing in God's

[mind]. This is not the case with the general; for the general exists in the army [only] so that the order in the army can be derived from him. This would seem to indicate that with respect to the good and the best obtaining in the world it is true that [it obtains in two forms]: (1) it exists separate and by itself, i.e., God; and (2) it is manifested as well in the order within existent things. Aristotle [goes on to] say that together with the good that exists by itself, i.e., God, all things are [ordered] according to some species; i.e., all things derive their good from the order and rightness [in the divine mind], although in varying degrees. e.g., plants acquire less of that good than do the various species of fish, and birds exhibit more perfection than do the fish. In short, anything that is closer to perfection acquires more of that order existing in the soul of the First Cause. This is our interpretation of this chapter; it is both consonant with Aristotle's language and with the truth itself. Averroes, however, has given a different interpretation of this passage that is not consonant with Aristotle's language. At any rate, it is clear that Aristotle maintains that the order in the universe emanates from the intelligible order [in the mind] of God, just as the order in the army emanates from the order in the soul of the general.

From this it is proved that the intelligible [order] of these forms must be unified. This is possible [for God], since He has no element [i.e., He is incorporeal]; for the element is the cause²² of the multiplicity manifested in these forms. This is so for two reasons. First, multiplicity in quantity accruing to material forms results from the subject; e.g., the form of *this* horse is numerically distinct from the form^{a3} of *another* horse.⁶² Secondly, the element introduces division in one and the same order, since part of it [i.e., the element or matter], is prepared to receive only part of that order. For example, the element differentiates the nutritive capacity from the sensory capacity because the nature of the matter, out of which the plants [qua genus] are^{b3} derived, is such that it cannot by nature receive more perfection than this [i.e., the nutritive powers].⁶³ However, the

⁶²In each corporeal individual there is a unique configuration of material elements that differentiates that particular item from others in the same species. This is the Aristotelian notion of matter as the principle of individuation (Aristotle, *Metaphysics*, VII:10, 1035b 29-32).

⁶³Aristotle, *On the Soul*, II:3, 415a 2-3.

intelligible order of these forms is not differentiated in this way, as is evident. It is also evident that the intelligible [order] of these forms is unified in a more perfect^{c3} manner than is the order inherent in the material forms [themselves]; for it unifies what^{d3} is diverse amongst the material forms. The argument that claims that there is no separate agent responsible for the generation of material forms and that is similar in some way to them has, therefore, been refuted.

[Finally], the ninth argument -- i.e., if there were a separate form that generates the^{e3} material form and is similar to it there would be no advantage^{f3} in this process of generation, since the separate forms enjoy a more noble sort of existence than the existence they have when they are embodied in matter -- does not entail that the generation [of material forms] is not traceable to a separate agent. What seems to follow is that there are separate forms that are not similar in every respect to the material forms, as Plato seems to have thought according to Aristotle's account of his doctrine. However, that there is a separate agent in which these forms are present in the manner in which the forms of the artifact are present in the soul of the artisan has not thereby been shown to be impossible. In short, the beneficent agent does not, as far as it is possible, refrain from bestowing^{g3} beneficence. And^{h3} since matter is defective by its very nature andⁱ³ can receive something of goodness and perfection, which is, as it were, intermediate between the

perfect being possessed by these forms in the [mind] of the separate agent and the [defective] being of matter, it is proper that from this separate agent this second [or intermediary] kind of being, which is characteristic of these forms, emanate. ⁶⁴

If someone were to object that if this were the case the material form would exist for the sake of the matter, and this is the opposite of Aristotle's view, which correctly claims that matter is for the sake of form, we reply that this [consequence] does not follow from this theory. We do not maintain that the material form exists so that its subject exist^{j3}. Rather, we maintain that this generating agent is that which creates, [as it were], the matter in this manner of creation in order that the form, which is the perfection of the matter, accrue to it. This objection, however, would have been valid had we asserted the existence of two agents for this process of generation -- one as the agent of the matter, the other [the agent]^{k3} for the form when the matter is prepared to receive it.

⁶⁴This second type of being is the existence of the forms in matter. This level of being is not as perfect as the degree of being possessed by these forms when they are in the mind of a separate intellect; yet it is superior to the level of being possessed by matter, which is the lowest level of existence.

-121-

It has thus been shown that none of the aforementioned arguments of Averroes establishes the claim that the generation of terrestrial phenomena is not traceable to a separate agent, in which these generated^{l3} material forms are present in the way the forms of artifacts are present in the soul of the artisan.

-122-

CHAPTER IV

NOW that Averroes' arguments against the thesis that this generation is traceable to a separate agent have been shown to be invalid and that consequently there is some justification to the arguments of Themistius that there is such an agent for this generation (a view that both Aristotle and Averroes [really] do accept, as we indicated in the previous chapter), it is appropriate that we complete this investigation as best we can.

It is evident that in the generation of something in which no goal was intended, whatever perfection and good occurs in it is attributable to chance. Thus, in human affairs we say that if some goal is achieved unintentionally, it results from chance. ¹Accordingly, concerning this marvelous generation of animate substances the following disjunction^a obtains: this generation necessarily^b results either from chance or from an agent who intends to bring about a goal by means of this generation. It is clear that there is no third alternative; for it is necessary that this generation be brought about by an agent, since it has been explained in the sciences that there is no self-generation. Now the agent responsible for this generation either intends a goal for which it has generated the substance or it does not intend such a goal. In the case of an agent who does not intend a goal, the achievement of the goal is attributable to chance, as has been pointed out. But it is obviously false to attribute this marvelous process of generation to chance, for chance generation attains completion imperfectly, infrequently, and only in a few things. This [kind of] generation, however, exhibits an extraordinary amount of perfection; it is also exhibited in many things and continuously. Therefore, it is clear that it is impossible for it to have been effected by an agent who does not act intentionally. Thus, it must be the case that this generation results

from an agent having a purpose according to which the generation takes place. Hence, all generation is guided towards the most perfect goal. Now, this agent that intends such a goal is either corporeal or separate [i.e., incorporeal]. If corporeal it is either in the seed from which the animate substance is generated or in some external source, i.e., in the bearer of the seed [i.e., its parent]; for there is no external agent that could possibly have this material power for the agency of generation except the bearer of the seed, as is evident. Moreover, the [very same] proofs that refute the

¹Aristotle, *Physics*, II: 4-6.

-123-

thesis that this power is in the bearer of the seed also refute the thesis that it is in something external to [the generated substance]. This will become obvious from the proofs that we shall present on this ^c topic.

The (first of these alternatives), i.e., that the intentional agent of this generation is in the seed, is clearly invalid, and on several grounds. First, if this were the case, the faculty for this apprehension [of the purpose] would be generated in the seed, as is the case in the other material forms.² Hence, it would follow that at first there is a potentiality for apprehension, and then afterwards it is realized; for the generation of the potentiality of apprehension precedes the occurrence of actual apprehension, as is the case in the other material qualities. Since the material [cognitive] capacities do not acquire apprehension except by means of the senses, as has been shown in *On the Soul*, it would follow that in the seed there would be a perceptual cognition^d; but since perceptual cognitions cannot occur without a [sensory] organ, it would follow that the seed would have a sensory organ. But this is obviously absurd, since the seed is composed of homomerous parts, not of organs.³

Second, if this were so (i.e., the agent is in the seed), the means for the sake of the end which results from it would be superior to that very end. Now it is clear that seeds by their very nature exist for the sake of that which is generated from them. But if this extraordinary [power] of apprehension were in the seeds, the seeds would be superior to the things generated from them, i.e., the plants and the animals; for the latter do not possess this extraordinary power of apprehension, and it would follow that what is potential [i.e., the seed] is superior to what is actual [i.e., the plant or animal], which is utterly absurd. We say, however, that apprehension renders things that can apprehend more noble, since it is evident that things vary in superiority according to their differences in cognitive ability and that in whichever thing this ability is greater, the thing is more noble. The reader of this book needs no explanation of this point.

Third, it is evident that all the forms which prime matter can potentially receive are [ordered such that] some are the perfections of others and that some are for the sake of others. Hence, generation is in its totality one [system] of generation. This is true no matter whether we say that this whole ^e process is ordered by one agent in the most ^f extraordinarily wise and perfect manner possible and is intended by this agent, as has been demonstrated previously; or if we say that there are several agents subordinate to each other, as in the crafts where there are subordinate

²In the preceding chapter it was shown that the agent of generation apprehends the process of generation.

³Aristotle, *Generation of Animals*, I:18, 724b 28 - 30. Organs are more complex parts of an organism, whereas the homomerous parts (e.g., flesh and bones) are uniform.

artisans working under the master artisan, but it is from the master artisan that the whole process is ordered and it is he who sets the goals for it. Now if we say that the whole process derives from one agent, what was [initially] assumed to be a material [agent] is [really] a separate agent; for a material power cannot be one in many things. Therefore, it is obviously impossible for the one corporeal agent to exist in all these seeds; rather, the conceivability [of one agent present in many things] is possible when the agent is separate and conjoins with the seeds in a non-essential manner. ⁴ On the other hand, if it is alleged that some of these ^g agents are hierarchically ordered, it would follow that the master agent generates its ^h subordinate agents, just as the master-craft generates its subordinate crafts. For if this were not so, it would be impossible for the subordinate crafts to be directed toward the goal set by the master-craft. Hence, the master-agent knows the law, order, and rightness of existent things in its entirety; and whatever satisfies this condition is separate, not corporeal, as is obvious. In short, since what is generated primarily in this process of generation is the essence of the thing, not its material [i.e. accidental] features, it is necessary that the generating agent that apprehends the goal, for which it is the agent, know the essence of that substance. And the faculty that apprehends the essence is necessarily an intellect; hence, the generating agent is separate. This argument entails that it is impossible for the agent of generation to be corporeal, either [a power] in the seed or in the bearer of the seed.

Fourth, it is evident that it is impossible for a soul to exist in the seed, all the more so a soul having this extraordinary power of apprehension. For it is clear from the definition of "soul" that the soul is the first actuality of a natural body having organs. ⁵ Since it is evident that the seed is not an organ but consists of homomerous parts, it is clear that there is no soul in the seed. ⁶ Hence, it has no soul with this extraordinary cognitive power.

Fifth, we see that the most perfect kind of seed is the flowing, watery type [i.e., semen]; but whatever satisfies this condition has no soul, for an animate substance possesses corporeality and stability by virtue of which its allotted period of time is preserved ¹, as is evident by investigation throughout all [the species] of animate things. In short, we observe that in the more noble animate substances nature has provided for them by giving them many organs for their preservation, as has been demonstrated in the *Book of Animals*. Hence, it is false that in the seed there should be a soul of utmost nobility and that nature should not endow it with the

⁴Maimonides, *Guide*, II:12.

⁵Aristotle, *On the Soul*, II:1, 412b 5-6.

⁶Aristotle, *Generation of Animals*, II:3.

organs necessary for survival. Indeed, the seed is the easiest of things to be destroyed, as has been pointed out in the *Book of Animals*, concerning the topic of the seed in animals, which is the most perfect type of seed. ⁷

Sixth, if there were in the seed a soul-power capable of apprehending that which it produces, I would not know whether or not it could apprehend something besides the formation in the same species of the seedbearer. If we assume that it cannot, I am puzzled how the seed of a horse can create a mule, especially since it has no apprehension except for the creation of a horse. If, on the other hand, it does apprehend formations besides those in its own species, it would follow that it would apprehend the particular species of the female seed it meets, so that it could know which formation it makes. For example, if the female were a mare, the seed of a horse would produce in

her^j the formation of a horse; if the female were an ass, it would produce in her^k the formation of a mule. Now, since this apprehension of the seed of the female implies the existence of a sense-faculty by means of which the seed [of the male] recognizes the species of the seed -- (this sense-faculty being either the tactile or visual or any of the other sense faculties^l) --, it would follow that the seed would have a sense-organ, which is clearly false; for the seed has no organ, all the more so a sense-organ.

Seventh, if there were in the seed a corporeal soul-power apprehending the formation it has produced, I would be at a loss to account for the occasional production of superfluous limbs. We cannot attribute this phenomenon to the "necessity of matter".⁸ For a builder is not forced to make superfluous things in a house merely because of the excess in materials, nor is the scribe forced to write additional words merely because he has extra scrolls^m and ink. It is therefore evident that if this were the case, this soul-power in this seed would be different from the otherⁿ soul-powers in other^o seeds which are of this species that do not make superfluous limbs^p. It is as if you were to say that this power is imperfect in this apprehension and [erroneously] thought that in the generation of this essence this extra limb was necessary. Now if this were true, I would be quite surprised, since imperfection is possible in this cognitive power, why it does not happen that its cognition isn't corrupted in such a way that it would put^q the limbs in the wrong place. For example, it would put the eyes^r in the back of the head or in another place. Moreover, if this imperfection in this power were possible, imperfections in generation should occur in the majority of cases. For by virtue of the extreme profundity and difficulty characteristic of this [type] of apprehension, it^s would be proper, if this corporeal cognitive and producing power is sub-

⁷Aristotle, *Generation of Animals*, II: 1-2; *Parts of Animals*, I: 5.

⁸Aristotle, *Generation of Animals* V: 1, 778a 31-778b 2. Plato, *Timaeus*, 48.

ject to imperfection, that this imperfection occur in the majority of cases. But this is contrary to what is observed in this kind of generation.

Eighth, if this were the case [i.e., if the seed had a soul] it would not be possible for one seed to give rise to many fetations.⁹ It is obvious from investigation that when an organism having a cognitive soul is divided, not all of its parts are animate. Hence, it is impossible in one seed, when it is divided and its parts enter into the many parts of the womb, that in each one of its parts there is some [kind] of cognitive soul-power such that each part [of the seed] produces one fetation. Moreover, even if we were to grant that when the seed divides, each one of its parts has a cognitive soul, this cognition would be for the production of either a male or female; it would be impossible in the case of a single organism when it is divided that its parts have a soul different from the soul possessed by the whole animal. Hence, if it were alleged that in the seed there is some kind of cognitive soul-power by virtue of which the seed performs its generative [function], it would follow that when one seed produces many fetations all of these fetations should be of the same gender. For it produces what it apprehends of the [activity of] reproduction; and if the seed as a whole had an apprehension for generating a male, all the fetations will be male, and *mutis mutandis* if the seed [as a whole] had an apprehension for generating a female. But all of this is false! We observe that from one seed both males and females are produced. If someone were to object that the seed as a whole has the capacity to produce both males and females and that it makes a male in the appropriate matter for the generation of males and a female in the matter proper for females, it would follow that the seed would have to *know* that the matter it encounters is proper for the male or female form so that it

can perform the necessary action for reproduction. But this entails that the seed has a sensory organ by means of which it apprehends this fact. This is, however, clearly absurd.

[Let us now consider the second of the original two alternatives]. I maintain also that this corporeal cognitive-power responsible for generation is not in some external body, e.g., the bearer of the seed, [or parent]. This is evident on several grounds. First, we see that sometimes this generation is completed when the seed-bearer has already departed, e.g., the male. Sometimes the generation is completed without any of the parents being alive, as for example in eggs; sometimes the parents both die, yet the offspring are hatched as long as a female sits upon them, no matter whether she is of the same or of a different species. This entails that the agent of generation is not a soul-power in the seed-bearer, either having

⁹ Ubarim I use Peck's term "fotation" κύμα. *Aristotle, Generation of Animals, translated by A.L. Peck (Loeb Classics, 1953), Introduction, 1, xii.*

-127-

or not having apprehension.

Second, we find many animals generating from putrefaction, [or spontaneously]. This shows that a seed-bearer [i.e., parent] is not a necessary condition of the generation of an animal; all the more so that it is not the [alleged] cognitive soul-power in the parent that is the agent of generation. It also proves that the agent responsible for generation is not a soul-power in the parent, either having or not having apprehension.

Third, it is clearly impossible for a seed-bearer to accomplish this activity upon something else [merely] by means of this corporeal soulpower, whether or not this power apprehends its production. For whatever an agent having a corporeal form does upon something other than itself is exterior to that thing. This is evident in crafts amongst men and in some animals. On the other hand, this kind of generation is a [process] that [penetrates] throughout *every* part of the generated substance. Thus, it is evident that the agent of generation is not a corporeal ^u soul-power in the seed-bearer. ¹⁰

Fourth, it is not the nature of a corporeal form to create a form even in its [own] subject. Thus, someone who lacks a limb cannot generate it in himself. Accordingly, I would like to know how this form could create *all* the limbs [in something that is] not in its subject? Indeed, it cannot even create a single limb in its [own] subject in which ^v it is more capable of being productive! That it is more capable of working upon its own subject than upon something else is quite obvious. The activities of a corporeal form are essentially and primarily ordered towards its own subject and it is in this subject that these activities are manifested. This too shows that the agent of generation is not a soul-power, having or not having apprehension, in the seed-bearer.

Fifth, men have no [special] skill in reproduction; all the more so are they devoid of this extraordinary skill [i.e., the skill required to produce a well-ordered organism], of whose [wisdom] men have wearied themselves in [trying to] understand even a small part. This shows that the seed-bearer has no skill to produce a fetus. ¹¹

Sixth, we find no person who can understand the [precise] order in the generation of a man; for no person can know perfectly ^w the proportioned heat in the various limbs by virtue of which each of these limbs performs its activities. Nor [does anyone know] the [order in the] creation of the limbs in their totality or their mutual proportions in size. This is obvious, so there is no need

for further comment. Hence, how is it possible for the seed-bearer to have the soul-power that apprehends this extraordinary

¹⁰Themistius, *Paraphrase of Aristotle's Metaphysics*, Book XII, p. 8 (Hebrew), p. 9 (Latin).

¹¹Ibid.

-128-

creation but there is no human being who has this cognitive capacity? This [hypothesis] is clearly absurd.

Seventh, if the hypothesis were true, all plants^x and animals would apprehend this marvelous process of generation which they [themselves allegedly] accomplish. But this is clearly false, since a plant has no apprehension whatever, all the more so an apprehension of the extraordinary sort.

In addition [to these difficulties] this theory is open to many of the aforementioned absurdities concerning the hypothesis that the seed itself has this cognitive soul-power, as can be seen upon just a bit of reflection. If this is so, i.e., the agent of generation cannot be a corporeal power knowing the process of generation, neither in the seed nor in something external [i.e., the seed-bearer] -- and it has already been shown that if the agent of the generation is to be described in this way it has to be either in the seed or in something external to it --, it is evident that it is not^y possible for the agent of generation that apprehends its creative activity to be corporeal. Hence, it follows that this agent is separate [i.e., incorporeal] and apprehends that which it produces. And it is fitting that the agent of generation be separate. For, since art is subordinate to nature and art is ordered by intellect, nature, which is superior to art, is more appropriately ordered by an intellect. For that which is superior and prior to the intellect is necessarily an intellect [itself].¹²

However, whether [this activity] emanates from it directly or indirectly is a question that requires examination. By "directly" I mean that the separate agent uses no instrument in accomplishing this generation except the natural heat in the seed or that which is appropriate in things that are generated without seeds. The separate agent by itself moves the matter in this extraordinary manner by means of the natural heat in the seed. On the other hand, when I say that the [separate agent] performs this activity "indirectly", [I mean that] a soul-power¹³ emanates from the agent to the seed by virtue of which this marvelous generation is accomplished.

Now it seems that the separate agent generates animate substances *directly* except for the natural heat in the seed. If we were to say that it performs this activity by means of some *soul-power* with which it endows the seed, the seed would then possess a nature that is superior to the

¹²This argument attempts to show that if art, which is subordinate to nature, is governed by an intellect, i.e., the mind of the artisan, nature, which is superior to art, is also governed by an intellect, namely, the Agent Intellect. For, if in the case of art the agent is an intellect, then the agent in nature, which is superior to art, must be in some sense superior to the agent in art; but only another intellect can be superior and prior to an intellect.

¹³I adopt the following emendation: "soul-power" (Ko'ah nafshiyyi) instead of "natural power" (Ko'ah tivi). The former expression occurs in the sentence after the next.

-129-

nature found in that which is generated from it. For the activities that the seed would perform would be infinitely more extraordinary than those performed by that which is generated from it. From the activities we always infer the forms according to which these activities are derived. Hence, the form of the seed would be more perfect than the soul in ^z the seed-bearer [generated from it.] This consequence yields many ^{a1} absurdities.

First, that which is in potentiality [i.e., the seed] would be more perfect than that which is in actuality [i.e., the organism generated, or the seed-bearer] - which is absurd. ¹⁴ Second, the tempered form would be superior to the soul itself. For, we cannot say that in the seed there is a soul, since the seed is made of homomerous parts; we can say, however, that in the seed there is a tempered form. But the claim that this tempered form is superior to the soul is absurd! Third, if it were true that the seed is superior to the seed-bearer, nature would provide more for the former than for the latter; for whatever natural phenomenon is more perfect nature provides more for it by endowing it with more means for selfpreservation. But this is not so in this case. For nature does not provide in this way more for the seed; indeed the latter has no organs and because of its watery character it is quite susceptible to destruction. Hence, in the seed there is no superior form according to which these extraordinary ^{b1} activities are derived.

That the activities exhibited by the seed are infinitely more extraordinary than those displayed by that which is generated from it is evident. The seed-bearer cannot create even one of its smaller limbs; it can produce, however, an increase in quantity [i.e., it can grow], although its form remains constant. The seed, however, makes all the limbs. Accordingly, there is no relation [i.e., similarity] between the activities derived from the seed-bearer and those derived from the seed itself. Since this power cannot be in the seed by virtue of a form [in it], it is evident that the incorporeal agent accomplishes this creative activity *directly*, except for the natural heat ¹⁵ in the seed that prepares the generated substance ^{c1} to receive the will of the agent. Moreover, it is clear that the natural heat is present in the seed [in so far as it comes] from the seed-bearer. However, the heavenly bodies cooperate in preserving the proportioned amount of natural heat in existent things throughout the four sea-

¹⁴On the hypothesis under consideration, the seed possesses an extraordinary generative power, which makes it superior to that which it generates. But this would mean that that which is potential [i.e., the seed] is superior to that which is actual [i.e., the seed-bearer, or organism]. This violates one of Aristotle's axioms [Aristotle, *On the Soul, II: 1; Generation of Animals, II: 3*].

¹⁵I emend *ha-koala ha-yesodi* ("the natural power") to *ha-hom ha-yesodi* ("the natural heat"), as in the next sentence.

sons of the year which are generated from them, as has been previously explained. ¹⁶ For in this manner the equilibrium ^{d1} amongst the contraries, [i.e., the contrary elements], is achieved.

If we were to say, however, that a natural form is generated in the seed by virtue of which this extraordinary creation is ordered, either of two consequences would follow. Either this form is generated in the seed from a seed-bearer; or it is generated in the seed by an incorporeal agent which is ultimately responsible for this generative process. If we say the latter, the generation of the seed involves two agents, one giving the mixture [of the elements], the other giving the [specific and proper] form [itself]. But this is absurd, as has been previously demonstrated; for it has been shown that it is impossible for one generation to proceed from two agents, one giving that which precedes the end, the other giving the end itself. ¹⁷ If, on the other hand, we say that

this form is generated in the seed from the seed-bearer analogous to the way the forms of flesh and bones are generated from it [i.e., the seed-bearer] by means of nutriment,¹⁸ several absurdities ensue from this hypothesis.^{e1}

First, if this power in the seed, which is related in some way to the power in the seed-bearer^{f1}, [or generator], were to derive from the seedbearer [itself], it would be more appropriate for such a power to be in the last stage of the nutriment [and not in the seed itself], since the last stage of the nutriment^{g1} is more like the nature of the seed-bearer than is the seed, which is [but] the residue of the final nutriment, for the residue is alien to that which possesses the residue.¹⁹ And if it were the nature of that which is nourished [i.e., the seed-bearer] to give this form, [or power in the seed], which is similar in some respect to its [own] form in so far as the seed is the residue of the final nutriment and is foreign to its [i.e., the seed-bearer's] nature, it would be more appropriate that it give this power to the *nutriment*. For forms that are related to and agree with each other should have subjects that are related to and agree with [each other]. But if this is the case, there would be in the nutriment [both] a nutritive power and a formative, [or generating], power, and this is obviously absurd, as has been shown in Bk. 1, chap. 6.²⁰ For if this were so, the nutri-

¹⁶Gersonides, *The Wars*, Bk. 5, pt. 2, chap. 9, first question. Aristotle, *On Generation and Corruption*, II: 10; *Generation of Animals*, II: 3, 737a 3.

¹⁷Gersonides, *The Wars*, Bk. 5, pt. 3, chap. 3.

¹⁸Aristotle, *Generation of Animals* II: 4, 740b 20 - 23.

¹⁹This discussion is based upon Aristotle's *Generation of Animals*, I: 18, where Aristotle defines the semen as a secretion of the last stage of the nutriment, (725a 12 ff), or as a residue.

According to Aristotle the nutriment itself is external, or foreign, ἄλλοπαίσακτον to the body in the sense that it is introduced "from without" (*Generation of Animals*, I: 18, 724b 34). Hence, Gersonides urges, the semen, or seed, is even more "alien", (zar), since it is but the residue of the nutriment.

²⁰In Bk. 1, chap. 6 Gersonides argues that neither the nutriment nor the seed alone is sufficient to account for the generation of animals.

ment would be that which is nourished [i.e., the organism], and not nutriment. Accordingly, it would not be possible for [the process of] nutrition to be accomplished through it.

[Secondly], if this were so, [i.e., the form in the seed derives from the seed-bearer], the seed-bearer would be giving a form that is infinitely more noble than its own form, and this is clearly absurd. For a thing gives what is similar to its own nature when the recipient is completely affected by it; it gives less than this when the recipient does not completely receive its will. For example, fire heats [a thing] to a [degree of] heat^{h1} less than its own degree of heat when that thing does not completely receive its activity; it heats the thing to its own degree of heat when the latter does receive completely its activity. Thus, it is clear that an object gives either what is like its nature or less than this; but that it can give something that is infinitely more noble than itself is impossible. If it is objected that sensationⁱ¹ gives rise to the object of knowledge, which is more perfect than itself, it should be noted that sensation does not give rise to the object of knowledge by^{j1} itself nor via some capacity given to it by the sensible object. Rather, it is the Agent Intellect that gives rise to the object of knowledge, as has been explained in *On the Soul*.²¹ Sensation serves as an instrument for the Agent Intellect. However, if this power in the seed were to come from the seed-bearer, the latter would give something more perfect than itself by means of a power^{k1} given it by the separate agent [i.e., the Agent Intellect]. But this is clearly

absurd. In general, a thing does not give [something] that is more perfect than itself. Rather, it gives something which is either less perfect than itself, as in things made by skills, since the skill itself is more perfect [than the artifacts] for it is intellectual, whereas the forms made by the skill are [just] shapes and accidental [features] in the body; or, a thing gives something equal to itself, as in the case of a fire when it makes a fire similar to itself.

[Third], if this form in the seed came from the seed-bearer because the latter is in some sense similar [to it], how are we to explain those things that are born without seeds? In such cases the decaying material provides the natural heat with the help of the heavenly bodies. Thus, from different kinds of decaying matter different kinds of animals are generated; e.g., from fermenting wine gnats are generated. It is evident that there is not in this case something similar that gives the form in the seed through ¹¹ which this activity [of spontaneous generation] is accomplished except the separate agent [i.e., the Agent Intellect]. Indeed, it can be shown that it is impossible for the separate agent to give this form in the

²¹Aristotle, *On the Soul*, III: 5.

seed; for if it were possible, one process of generation would have two agents, [i.e., the separate agent and this form in the seed], and this has been shown to be false. Hence, it is clear that the separate agent accomplishes this generation without any intermediary except the natural heat present in seeds or something appropriate for them; for this generation cannot occur by means of a form in the seed deriving either from the separate agent or from the seed-bearer. It ^{m1} is also impossible for this generation to take place by means of a form in the seed-bearer, as is evident from the preceding.

Moreover, if this act of the separate agent were by means of a form either in the seed or in the seed-bearer, it would be difficult to explain how a species could at one time propagate its own kind but at another time propagate something not of its own species. For example, a horse sometimes propagates a horse, sometimes a mule. For, if this form were in the seed-bearer, it would not be possible for the form ⁿ¹ to produce different creations, since from one form different things cannot be derived in this way. This is obvious. On the other hand, if the form is in the seed, it is equally obvious that it has the power to generate only one species.

If it is objected that the seed could change when it meets the femaleseed of another species and that its own form is destroyed and another form is generated in it by virtue of which this second generation [i.e., hybridization] is accomplished, we reply that this suggestion is untenable. For it does not seem that the seed can be destroyed yet remain [as] another seed, no more than it would be possible for an organism to be destroyed yet remain [as] another organism. ²² Whereas if it is assumed that this generation [i.e., cross-breeding] is [ultimately brought about] by the separate agent without an intermediary, there is no difficulty in accounting for it. For the separate agent performs its activity by means of the natural heat in the seed, and the generation produced by the [separate agent] will be [a function of] the heat [in the seed]. And since ^{o1} the male-seed could change when it meets a female-seed of a different species because of the great diversity in seeds, it can happen that the heat of the [male] seed reaches a different degree of heat from the heat of the seed that encounters the seed of a female of the [same] species as the seed-bearer. Hence, the separate agent produces different kinds of generations from these seeds. Herein ^{p1} has been demonstrated that the separate agent is the agent [producing] animate substances by means of the natural heat in the seed without another ^{q1} form in the seed serving as an intermediary. Aristotle

was, therefore, right in saying that in the seed there is a divine power, i.e., intellect. ²³ This power is related to that which

²² If a seed is destroyed it may become water, but it is not a different *seed*, just as the destruction of a mouse results in a mass of flesh and blood, but not a bird.

²³ Aristotle, *Generation of Animals*, II: 3, 736b 27 ff. Touati, *La Pensée*, 343, n. 80.

-133-

is generated in the same way as a craft is related to the artifacts made from that craft, as Averroes has claimed in behalf of Aristotle. ²⁴

However, Averroes' rejection of this claim that the agent [working] within the seed is an intellect on the grounds that this agent employs an instrument in its activity has already been refuted. Indeed, Abu Bakr [ibn Bajjal was also of this opinion, as Averroes reports in his commentary on *The Book of Animals*. ²⁵

Someone might object to what has been demonstrated here and argue that if this activity proceeds from the separate intellect without any intermediary, how is it possible for any imperfections in procreation to occur, as we often observe, particularly in cases of additional limbs? Such a phenomenon would be impossible with an agent that knows what it is doing and that intentionally sets the goal towards which this activity is directed, as has been previously demonstrated. However, if this activity were to proceed from the agent via some intermediary, no such absurdity would ensue; for the intermediary does not understand ^{r1} what it is doing. Hence, it would not be impossible for this kind of imperfection to occur as a result of [the intermediary]. We say [in reply] that if the separate ^{s1} agent knew the particular [as a particular] that it generates, this objection would be plausible. But it is evident that the separate agent does not know the particular [as particular]; rather, its activity reaches *everything* that is prepared to receive its Will. ²⁶ Therefore, when the matter is not prepared to receive its will, these imperfections in generation occur by virtue of the "necessity of matter". ²⁷

A [further] objection could be raised: what prevents this generation from deriving from an agent that has no knowledge at all of what it is doing? Indeed, from the nutritive faculty in an animate substance emanate many extraordinary and perfect processes pertaining to the particular generation; yet it is not aware of its activities. In reply let us recall that the nutritive faculty performs its functions by virtue of a power which has emanated to it from the separate agent. It would be utterly false to claim that these perfect activities derive from an agent that does not set a goal towards which these activities are directed. We attribute

²⁴ Averroes, *Long Commentary on the Metaphysics*, Book XII, Arabic, 1501, Latin 305A. Genequand, *Ibn Rushd's Metaphysics*, 110.

²⁵ Averroes, *Commentarium De Generatione Animalium*, II, 75 K. Davidson, *Averroes on the Active Intellect as a Cause of Existence*, 212-13.

²⁶ Gersonides is presupposing here his discussion of knowledge of particulars in Books 2 and 3. There it was demonstrated that neither the Agent Intellect nor God has knowledge of particulars as particulars.

²⁷ Aristotle, *Generation of Animals*, IV: 3, 767b 6 ff, 769b 10, 770a 6 ff; IV: 4, 772b 3 ff. Plato, *Timaeus*, 48. Touati, *La Pensée*, [344](#) - [45](#).

-134-

such cases to chance, as has been indicated. The situation here is analogous to the situation where something is made by some craft: several activities derive from the craft in so far as the artisan has prepared certain devices to accomplish these activities. For example, the artisan makes the millstones and sets for them their purpose; [in addition], he makes instruments for them by virtue of which they move in circular motion, by means of which they do the grinding. Now the stones do not know what they are doing; the artisan, however, does know, and hence he gives them whatever instruments he gives for the achievement¹¹ of this activity. Analogously, with this kind of generation: the separate agent creates¹¹ the animate creature and gives it the appropriate organs to bring about, by means of the power given to them, whatever is required for the perfection of that organism. For the perfect agent is not satisfied in just generating something; but it gives in addition, as far as it is possible, the necessary means for its preservation.

And so it has been demonstrated that the agent responsible for the generation of animate substances is separate and that it accomplishes this generation without intermediaries, except for the natural heat in the seed. And since all the forms of which the primary matter is receptive are teleologically ordered [such that] some are the perfections of others, it is necessary to attribute the generation of all these forms to this separate agent. For their occurrence in the prime matter is one [process of] generation; and one [process of] generation, in so far as it is a unitary process, necessarily results from one agent. It also follows that the separate agent responsible for all these things should know the law, order, and rightness inherent in these sub-lunar phenomena, since these things acquire their very existence from the intelligible order of them in the soul of this separate agent. It is not the case that the separate agent derives this intelligible [order] from them, as is the case in human cognition. Therefore, it follows that the separate agent, whose existence has here been demonstrated, is the Agent Intellect, whose existence was proven in *On the Soul*.²⁸

Now, since whatever emanates from the heavenly bodies via the stars or the planets to these sub-lunar phenomena serves as instrument for this separate agent, it follows that this separate agent is either something that emanates from the movers of the heavenly bodies, such that all of them cooperate in the process of generation^{v1} as they cooperate in providing the instruments through which it [i.e., this form] will be [generated]; or this agent is such^{w1} that the movers of the heavenly bodies emanate from it; or this separate agent is [itself] one of the movers of the heavenly bod-

²⁸Aristotle, *On the Soul*, 111: 5. Gersonides, *The Wars*, vol. 1, Bk. 1, chap. 6.

this separate agent, it follows that this separate agent is either something that emanates from the movers of the heavenly bodies, such that all of them cooperate in the process of generation^{v1}, as they cooperate in providing the instruments through which it [i.e., this form] will be [generated]; or this agent is such^{w1} that the movers of the heavenly bodies emanate from it; or this separate agent is [itself] one of the movers of the heavenly bodies or of all of them together. It is evident, however, that not all the movers of the heavenly bodies together are responsible for the formation^{x1} of the sub-lunar phenomena; for this formation^{y1} necessarily comes from one agent, not from many agents, as has been previously proven. On the other hand, the proportioned heat in a sub-lunar substance is such that many things are properly responsible for it, for it results from mixture, and mixing involves many things; hence, all the heavenly bodies participate in giving the proportioned heat in existent things. It would be impossible, [however], for all of them to cooperate in the process of formation^{z1}, unless one separate agent were to emanate from all of

them that is *the* agent that performs the formative process. Hence, there remain only the following alternatives: either the separate agent emanates from all the movers of the heavenly bodies, or it is [itself] one of them, or it is something from which all the movers of the heavenly spheres emanate. Whichever turns out to be the case, it is clear from what has been discussed in this chapter that this agent is the very law, order and rightness of the sub-lunar world. This is what we have been able to ascertain about this separate agent at this stage of our inquiry. The inquiry into which of these alternatives is the true one ^{a2}, however, will be postponed ^{b2} until we have completed our discussion of the [nature] of the movers of the heavenly bodies. Then we shall understand [fully] the explanation of this point. ²⁹

²⁹Gersonides, *The Wars of the Lord*, Bk. 5, pt. 3, chaps. 8 - 13. Thomas Aquinas, *Summa Contra Gentiles, II*: 86-89. Abraham, *Shalom, Neve Shalom, VII*: Part 2, Chaps. 2,4 (end), and 5.

CHAPTER V

SINCE it has been demonstrated that there is a separate existent that is the agent of sub-lunar generation and that in addition it is the law, order, and rightness of these phenomena, it is evident that the First Intellect is the law, order, and rightness of existent things in the absolute sense. We have indicated that this is the view of Aristotle, as expressed in Book XII of the *Metaphysics*: for all of reality constitutes a unitary system. Accordingly, you see that the domain of the spheres provides, in the best way possible, for the sub-lunar world, and by means of this domain this separate agent performs its activities. This indicates that this [whole process] is ordered by something that has a total comprehension of this order. In general, if the First Intellect were the separate agent, whose existence has been previously proven, the relationship of the heavenly bodies to it would be analogous to the relationship that the instruments have to the artisan. Accordingly, it would be necessary that the law, order and rightness in the heavenly bodies be the effect of it in such a way that through them the law in terrestrial phenomena be achieved, just as the law, order, and rightness inherent in the sub-lunar world is its effect. Thus, it can be shown, as before, that the First Intellect is the law, order, and rightness of the universe in the absolute sense. It can also be shown that the First Intellect apprehends this plan in so far as it is a unitary [system], and this is the respect in which this plan is most perfect; for a unitary order must be the effect of an intelligible order that is numerically one. [On the other hand], if this separate agent were the effect of the First Intellect, it can be easily seen that the relationship between the two is like the relationship between the master-craft and the subordinate crafts: the latter know [only] a part of the plan [conceived] by the former, whereas the master-craft knows the whole plan. If [the First Intellect] does not [have complete knowledge of this plan], it would not be possible to achieve a unitary system between the heavenly bodies and the sublunar domain. For it would not be possible to claim that this unity results from chance, [especially when we consider] the perfection and continuity exhibited therein. Hence, the First Intellect is the law, order, and rightness of the whole universe in so far as [this plan] is a unified system.

CHAPTER VI

IT is proper that we examine whether the heavenly bodies have separate movers or non-separate movers or whether they have both of these things together. On the basis of these movers we shall

be able to prove the existence of the First Intellect, whose nature we explained in the previous chapter. Moreover, such an examination is intrinsically worthwhile and valuable. ¹

It is evident from Part II (of this treatise) that the movement of the heavenly bodies is the most perfect possible for the perfection of the sublunar world. This cannot be the result of chance, for chance phenomena cannot be for the most part so perfect all the time; if they are perfect this occurs only infrequently and briefly. Accordingly, it must be that the principle, [or cause], of this order in these movements is derived from an intellectual ^a conception [i.e., from an act of thought], just as in the case of the law, order, and rightness obtaining in the sub-lunar world. In this respect it is possible that this order [i.e., the celestial order] is an object of knowledge [of some intellect], for it appears that the cause of the order being an object of knowledge is that ^b it derives from some intellect ^c. For example, that we know of a particular crafted chair that it has a specific shape for the purpose of sitting is the result of the fact that the maker of it made it in this way for that purpose. ² This is obvious. When it is realized that the principle of this [celestial] movement is [derived] from an intellectual conception, it is evident that there must exist a separate intellect or several such intellects that are the principles of these movements.

We have claimed ^d that this act derives from an intellectual conception [siddur sikhli] because it is clear that it would not suffice for it to be derived from a material, [or perceptual], conception, for the latter is a conception of a particular item [of our experience]; and if such a concept were involved, the act deriving from it would not be continuous. For such an act would then derive from many concepts that arise successively; and whatever is of this nature is not continuous except accidentally and for only a short duration. ³ However, this act [i.e., the heavenly movements]

¹H. Wolfson, "The Plurality of Immovable Movers in Aristotle and Averroes," *Harvard Studies in Classical Philology* LXIII (1958), 233 - 53.

²The maker of the chair is a skilled craftsman who made the chair according to some plan and for a purpose.

³In his *Physics V*: 3, Aristotle defines several basic concepts in his philosophy of nature, particularly the concepts of succession, contiguity and continuity. The first of these three - succession -- is a relation involving the least "closeness" between the terms: x succeeds (*nilvah, nimshakh*) y if and only if y comes immediately after x, i.e., there is nothing of the same kind as x and y that intervenes between them. If x and y are such that they touch, or are in contact, then they are contiguous (*nikhrakh*). Finally, if x and y are contiguous and they touch in such a way that their touching extremities become one, then they are also continuous (*mitdabbeq*) (Wolfson, *Crescas' Critique of Aristotle*, 375-76).

that derives from this conception is continuous and numerically one, as is well-known. If this is so, it is evident that the act deriving from these bodies is derived entirely from one conception. However, a conception that is numerically one and encompasses all time must be an intellectual conception. If so, it follows that the act of the spheres is derived from an intellectual conception. In short, since one act is essentially derived from one conception, even though this act may not be continuous -- e.g., in medicine *one* discontinuous act is used to cure someone, i.e., first a drug is given for digestion, then a laxative for purging the noxious moisture -, all the more so it is proper in the case ^f of one *continuous* act that it derive from one conception.

After this has been established, it is necessary to determine whether the heavenly bodies themselves apprehend this order or whether they merely have the order without conceiving

anything of it, as is true of many phenomena in nature whose activities are ordered by an intellect but are themselves devoid of intellect. And if the heavenly bodies do apprehend this order, it is necessary to determine whether they have intellects or souls or both.

Now if they exhibit this order without apprehending it, their activity derives from them either naturally, like the movements of the elements, or by compulsion, i.e., there is something that forces them to move in this manner. ⁴It is clear that they do not move naturally; for natural motions imply a starting-point of the motion and an end-point of the motion, as with the elements and other naturally moving inanimate bodies; for such bodies seek rest not motion. In short, a naturally moving body has *rest* as its natural state; its motion is, however, accidental, i.e., when it is in a place inappropriate to its nature and it moves towards its natural place and [then] rests. Now in the movements of the heavenly bodies there is no distinct starting-point or end-point for their motions, for the sphere

⁴In his theory of motion Aristotle distinguishes between natural and forced motions, i.e., motion by violence (βίαια [Aristotle, *Physics*, VIII:4, 254b 7 ff. Wolfson, *Crescas' Critique*, 531.] A forced, or violent, motion is one that is contrary to the normal, i.e., natural, kinetic properties of the body. For example, it is natural for stones to move downward, but if someone were to throw a stone upward, it would certainly move upward, at least for a while; then, it will, of course, fall downward. The upward motion of the stone is "unnatural", or forced.

moves towards its [original] starting point; and there is no cessation of motion at all, according to what has been observed throughout the long time during which their history has been transmitted to us. Hence, it is clear that it is impossible for this motion to be natural. Moreover, it is also impossible for it to be forced motion; for forced motion is not continuous and occurs only infrequently. But this is contrary to the observed motions of these bodies.

Furthermore, we see that nature endows individual things with principles for the activities which are derived from them. And we find in addition that whatever object is more noble its principle is more adequate to bring about the activities of that object. For example, a plant has the principles of digestion and reproduction; similarly with non-rational animals and the human species. Now since the plant is the most inferior of [all living things], it has more need of some other thing for its own activities ^g than does the [non-rational] animal or man. The plant does not get enough nourishment by its own activities; it needs the help of human agriculture, since it does not move by itself and lacks [thereby] food. It would die in the place where it is fixed were it not for agriculture, which provides the food for it in its place. Similarly, in reproduction the plant needs even more agricultural work in order that its seeds be planted ^h in the proper place in the earth from which they will grow. Animals, however, require much less of this help than the plant, since they can move by themselves and acquire the food by which they are nourished. Similarly, they can move by themselves and meet a female of their species so as to reproduce. Nevertheless, they do need man; for among the domestic animals men obviously provide food for them. Men, however, do not need help from anything else in these things. For ⁱ men use domestic animals only as tools; they do not require them, as domestic animals do require man. Similarly, plants, because of their great need for external help in these activities [of nutrition and reproduction], exhibit a more remarkable effect from the sun, for example, than is found amongst the animals; and in turn this effect is greater amongst the animals than it is among men. For you find ^j that when the sun is in the southern zodiacal regions many of the functions of the plants are dormant such that they become almost dead, as is evident amongst most plants. When the sun is

in the northern regions the plants are best able to perform their functions. This shows that the plants require much help from the heavenly bodies in the performance of their functions. Animals, however, are not as susceptible to this effect from the solar seasons upon their functions as are the plants. Nevertheless, they do reproduce at determinate times of the year, just as plants give forth their fruit at fixed times of the year^k. Man, however, is the least affected by the heavenly bodies in his nutritive and reproductive activities, so that he reproduces and is nourished indifferently at any time

-140-

of the year.

Since it has been established (1) that nature provides individual things with a principle for the activities that derive from them, (2) that the more noble the thing the more adequate its principle is from which these activities of the thing are derived, and (3) that the heavenly bodies are clearly the most perfect of natural phenomena -- it is evident that it is false to say that nature has not given the heavenly bodies a principle by virtue of which they can perform the activities that derive from them. Indeed, since their level of perfection is so great, it is proper that this principle is more adequate for the realization of these activities than the principles governing the behavior exhibited by other natural substances. Hence, it is clear that celestial motion cannot be compulsory.

If it is objected that this motion could be derived from an intellect but that the heavenly bodies do not apprehend [this ordered motion], just as the reproduction [in seeds] is ordered by an intellect but the seeds do not apprehend [the order of reproduction], as has been pointed out, we reply as follows. This is indeed possible in things that are generated, since they require an external thing to generate them; for a thing does not generate itself. On the other hand, things that are perfectly generated have principles from which their activities are derived, as we have indicated. Since the heavenly bodies are perfectly generated (for^l there is no element of potentiality in their formation), they must have a principle from which activities are derived, as we have explained. In general, the motion of those things that seek motion [i.e., the elements and the composites compounded from them], is effected by the conception that has been given them by nature and is the principle of this motion; they are not compelled by this motion. Now if this is true for things in the sub-lunar world, which move for only a short time, all the more so is it proper for these perfect bodies that move continually and continuously.

Moreover, if the motions of the heavenly bodies were compulsory, that which forces [them] would necessarily be a body. For it would be difficult to see how the heavenly bodies could be subjugated to [or forced by] an intellect, from which this remarkable ordered [pattern] of motion whereby they move is derived, unless they are animate and conceive this motion and move according to it either because of fear and servitude or because of desire and choice. This is self-evident. Hence, it is clear that if the heavenly bodies were not animate, it would be impossible for them to move by virtue of an intellect from which these movements derive, unless there were another body that imparts to them their motion by force. Now, since that body [would itself] move [in a way] similar to the motion which it imparts to [the heavenly bodies], as has been explained in the *Physics*,⁵ it must be animate and moved by means of a conception;

⁵Aristotle, *Physics VIII*: [5](#) - [6](#).

-141-

or some other body moves it. But since it is impossible to have an infinite series [of movers] -- since an infinite number of bodies is impossible -it is clear that this process must terminate in an animate body that moves by means of a conception. If this is the case, it should have been maintained at the outset [that there is such an animate body]: for nature sees no advantage in having a plurality of spheres of this sort. Indeed, in nature there is no superfluity. Thus, it is evident that the heavenly spheres are animate, which is contrary to the original hypothesis. Hence, it is clear that the heavenly bodies do not exhibit this order without conceiving something of it. From this proof it can be demonstrated that the [heavenly bodies] move by virtue of conception. However, this proof does not indicate whether this conception is material or intellectual. ⁶ Indeed, it might be said that [although] their activities are derived from an intellectual conception ^m, they have a material conception of [them].

We maintain, however, that it is impossible for the heavenly bodies to have material conceptions, unless they have intellectual conceptions as well. This can be shown as follows. It is evident that a material conception is a concept of a specific particular object at a specific time ⁿ. Accordingly, from it only a particular action can be derived at a particular time. It is therefore evident that from a material conception no continuous activity can be derived. For if this were so, these conceptions would be contiguous and successive; but it is obvious that from successive conceptions [one] continuous activity cannot be derived. In conclusion, since the motions of the spheres are one and continuous, as has been explained in the *Physics*, ⁷ they must derive from one conception. And one conception that ranges over all time necessarily derives from an intellect; for material conceptions are necessarily generated and destroyed, since they refer to particular items that endure for a particular interval and exist at a particular place. Hence, the heavenly bodies must have intellects.

However, whether or not they have material souls ⁸ is a question requiring further examination. Some of the philosophers ⁹ have maintained that the heavenly bodies must have material souls, by virtue of which they apprehend the positions that they occupy at different times.

⁶A material conception, or concept (*tziyyur hiyyulani*), is a concept acquired through sense-perception; e.g., our concept of dog is gained through seeing, smelling, hearing, and touching real dogs. An intellectual conception (*tziyyur sikhli*), however, is a concept that is non-empirical, one that we acquire or possess without employing our sensory apparatus; they are the products of "pure reason" ; e.g., our concept of an irrational number. In the next paragraph Gersonides will differentiate between these two types of concepts in terms of the temporality of the material concept.

⁷Aristotle, *Physics VIII*, 5-8.

⁸Material souls have functions or capacities that make use of organs; e.g., sensation.

⁹Avicenna, as reported in Averroes' *Tahāfut al-Tahāfut* 16th Discussion, 301.

This would not be possible if they did not have the capacity to apprehend a particular individual thing. This thesis seems to be supported by our [earlier] discussion concerning some of the motions of the heavenly bodies; [i.e.,] equal angles are generated in equal times when their motions are referred to a [particular] part of the sphere. ¹⁰ This could be regarded as supporting the view that they apprehend their positions, and hence they are guided to equalize these angles in this manner.

Now it is evident that if the heavenly spheres do not require material souls for the accomplishment of their observed activities, the claim that they have material souls would be

gratuitous; for nature does nothing in vain. But it seems that they do not require a material soul [simply] because of the fact that we observe particular things emanating from them. For the intellect that is the cause of these generations [on earth] apprehends that which emanates from it, as has been explained, and makes ^o a particular thing without itself having a material power; for it does not apprehend that it is at *this* time creating *this* object. How this is possible has already been shown. ¹¹ For the same reason the spheres do not have to apprehend their positions at any particular moment; rather they apprehend the order ^p of their motions in a *general* way. And from that apprehension they move without having to know the particular details of their motions, just as a musical instrument is moved by the musician without [his] having to know which [particular] motion is the most appropriate. From his general conception [of the music] his limbs are moved in such a way that the appropriate movements [of the instrument] are achieved, as has been previously mentioned many times. Now when it is appreciated that the spheres do not require material souls, there is obviously no point in positing them; for in nature there is nothing gratuitous. Moreover, the apprehension of the particular positions by a material soul involves the use of one of the senses or a corporeal capacity resulting from the senses [e.g., memory]. But since it is obvious that the heavenly bodies do not have sense-organs, as Aristotle has demon-

¹⁰Gersonides is alluding here to an earlier discussion in Bk. 5, pt. 1 wherein the uniform motions of the heavenly bodies are accounted for by Ptolemy by positing a particular point [*heleq mah*], i.e., the equant, which is different from the center of the earth [Dreyer, *A History of Astronomy*, 197. T.S.Kuhn, *The Copernican Revolution*, (Vintage Books: New York, 1959), 70- 73. B. Goldstein, *Remarks in Ptolemy's Equant Model in Islamic Astronomy*, reprinted in his *Theory and Observation in Ancient and Medieval Astronomy*, essay 7; idem, *The Astronomy of Levi ben Gerson*, 158.]. [I owe this suggestion to Dr Tzvi Langermann]. The fact that some of the celestial movements do exhibit equal angles in equal times suggests, at least to some medieval thinkers, that the movers of the spheres have a *particular* conception of the particular position of the heavenly bodies.

¹¹*The Wars of the Lord*, vol. 2, Bk. 2, chap. 6.

strated, ¹² they do not have as well the material powers that follow upon these organs. Hence, it is evident that they have intellects but do not have material souls.

This proof yields three important results: first, there exist separate intellects that are the principles of the motions of the heavenly bodies; second, the heavenly bodies themselves, which are observed as moving, have intellects; and third, the heavenly bodies do not have material souls.

The [exact] number of these movers can also be demonstrated from what we have already established; for ^q their number necessarily corresponds to the number of the spheres, whose number has been previously [said to be] either forty-eight, fifty-eight, or sixty-four. For each of the planets Saturn, Jupiter, Mars, and Venus there are seven spheres, excluding the spheres (two for each of these four planets) required for their latitudinal motion, assuming that the plane of their motion of anomaly is continuous with the plane of their longitudinal motion when they are at the ascending or descending modes. ¹³ Moreover, there are two spheres each for Mars and Venus if they have an inclination in one direction only, as Ptolemy assumed. And if the latter [i.e., Ptolemaic] scheme is correct, the number of spheres for these planets will be forty. Now the number of spheres of Mercury will be on the first scheme [i.e., the forth-eight sphere system] eight, on the second scheme, ten, and on the third scheme, twelve. ¹⁴ The spheres of the moon are nine and those of the sun amount to three. The ^r number of spheres for the fixed stars is two.

Hence, according to the first system the number of spheres will be forty-eight; according to the second system the number will be fifty-eight; and for the third

¹²Aristotle, *On the Soul III*: 12, 434a 20-30; *On the Heavens*, II: 8, 290a 30-35 (Touati, *La Pensée*, 315, n. 22).

¹³*The Wars of the Lord*, supra, Bk. 5, pt. t 2, chap. 7.

¹⁴Something seems wrong here with these numbers for the spheres of Mercury, which are in the manuscripts and printed editions given as 8, 10, and 12. In attempting to obtain the three models of 48, 58, or 64 spheres one needs to keep the numbers of spheres for the sun, moon, and stars constant (i.e., 14). Accordingly, one obtains a model of 48 spheres only if the minimum number of 28 spheres for the four planets (excluding Mercury) is used, and then 6 for Mercury (See Gersonides' comment at the end of chap. 13 of this Book). The model of 58 spheres is obtained by adding the 8 spheres that are introduced to account for the latitudinal motion of Saturn, Jupiter, Mars, and Venus, and then assigning to Mercury 8 spheres. Finally, a 64 sphere model is obtained by adding the four spheres needed to account for the inclinations of Mars and Venus, resulting in the maximum number of spheres for the planets other than Mercury -- 40, and then assigning 10 spheres for Mercury. This maximal scheme for the planets is the one referred to by Gersonides as the "latter", or Ptolemaic, model. It would appear then that the text dealing with the number of spheres for Mercury should be emended in the manner suggested above in order to arrive at these three models. It should be noted that the Florence manuscript of *The Wars of the Lord* omits the whole sentence dealing with the spheres of Mercury, suggesting perhaps some perplexity on the part of the scribe or some difficulty in the text from which this manuscript was copied.

Aristotle's own discussion of this topic suffers from computational difficulties, which were noted by several of the Greek commentators such as Sosigenes and Simplicius. Aristotle gave two alternative models: a 55 sphere schema and a 47 sphere schema. But it would appear that the latter should be 49 sphere model, given the astronomical argument used by Aristotle to arrive at it. This point was also noted by Thomas Aquinas [Ross, *Aristotle's Metaphysics*, Vol. II (Oxford, 1924), pp. 384-95; Thomas Aquinas, *Commentary on Aristotle's Metaphysics*, Vol. II, Book XII, Lectio 10, p. 907]. Averroes also expressed some doubts about the Aristotelian-Ptolemaic models and states that "at this time" the agreed upon number of movers and motions is 50. (Genequand, *Ibn Rushd's Metaphysics*, 185). In recent times this topic has been discussed in D.R. Dick's *Early Greek Astronomy to Aristotle* (New York, 1970), 200-03 and in N.R. Hanson, *Constellations and Conjectures*, ed. W.C. Humphreys, Jr. (Boston, 1973), 69-81.

-144-

system the number will be sixty-four. But if it is seen that the motions^s of the planets require the postulation of additional spheres, then the number of movers would be correspondingly greater than this number. On the other hand, if there is no need to postulate additional spheres to account for the motions of the planets, the number of these movers will necessarily be this number and not greater. The thesis that there are other moving spheres that do not move any planet is obviously absurd, as has been indicated. Aristotle too discussed this topic in the *Metaphysics*. ¹⁵

The question whether there are separate intelligences besides the movers of the spheres has, however, not yet been determined. We shall discuss this topic after the following [issue has been settled].

It should be noted that Aristotle [attempted to] prove in the *Physics* too that the heavenly bodies have separate movers; but that argument is, in our opinion, inadequate. He bases his argument on the infinite duration of the motive power of these movers. He argues that if these movers were powers residing in bodies, they would have only a finite motive capacity; for a capacity that resides in a body is divisible along with the division of the body. Accordingly, if this [power were in the body], the motive capacity would [ultimately] cease. It has been demonstrated, however, that it is everlasting. We have here an impossible contradiction. [Hence, there must be separate movers].¹⁶

That it follows from this [hypothesis] that this motive power would cease can be shown as follows. We see in the case of a motive^t power residing in a body that to the extent that its motive power is greater it completes a determinate quantity of motivity in a shorter^u time. Also, that which has a greater power has the capacity to move one and the same object for a longer period of time. Hence, it follows that the duration of a force residing in a body is finite, which means that its motive power will cease.¹⁷ Now, since the motions of the heavenly bodies are

¹⁵Aristotle, *Metaphysics*, XII: 8.

¹⁶Aristotle, *Physics*, VIII: 10; VI: 1. Maimonides, *Guide*, II, Introduction, proposition 12. Wolfson, *Crescas' Critique of Aristotle*, 267-73, 602-14. Vajda, *Isaac Albalag*, 181 ff.

¹⁷Aristotle, *Physics*, VIII: 10.

continuous, it is clear from this proof that they move by means of a power *not* residing in a body.

When we examine this argument, however, we find a difficulty that should not be overlooked. The fact that a weak motive power [moves] for a shorter period of time amongst living things [can be explained] in either or both of two ways. First, in such things the proportion between mover and the moved object is not constant^v but weakens [either] because the motion by its nature diminishes the natural^w heat, as has been explained in the sciences; or because these things tend toward their [own] destruction, since they are necessarily corruptible. Second, the thing that the living creature moves has a natural motion contrary to the motion by virtue of which it moves [and receives] from the mover; therefore, it will suffer fatigue and weariness, and the motion thereby ceases. For example, when a man walks his motion will inevitably cease, since his natural heat will diminish as the result of the movement, and the proper proportion between the mover and the moved is no longer constant. [The motion could cease] for the second reason as well. Man has a natural motion towards the center [of the earth] because of his weight. But since his voluntary motion is in a different direction, his natural motion is opposed to his voluntary motion, resulting in fatigue. Thus, when this opposition is greater his fatigue sets in quicker. For example, a man becomes tired more easily when he climbs a mountain than when he descends into a valley or walks in a plain. For the same reason, man tires sooner when he carries, for example, three weights than when he carries one weight. For the weight that he carries has a nature opposite to the motion by means of which he moves it; and to the extent that the load is larger so is this opposition greater, since the weight of the larger load is greater.

On the other hand, when the proportion between the mover and the moved object is uniform and when there is no nature [or natural motion] opposing the motion moving it, there is no necessity for the object to cease moving. This is evident in the case of the elements. A stone, for example, moves downward when it is not in its natural place; it does not have a nature that requires cessation of motion, except in so far as it completes its motion. This is so because the proportion between the mover and the moved object in this motion is uniform as long as the motion continues; nor does the stone have any other natural motion that would oppose this motion.

That the stone does not have a nature that entails the cessation of its motion, except for the completion of its motion, can be shown as follows.

-146-

Let us suppose, for example, that it has a nature that entails the cessation of its motion after it has persisted in motion for some time (assuming this is possible) and that this period is, say, a year or any period you wish. It would follow from this hypothesis that the stone would remain in the air and would not fall to the center [of the earth]. But this is absurd. For let us suppose that the stone moves for a definite interval of time. To this temporal ^x interval, say A, [corresponds] a definite magnitude ^y of distance [traversed throughout this interval]. Let this magnitude [of distance] be B. In addition, let the time at which the stone ceases to move (if this were possible) be C. It is evident that the magnitude A could be multiplied many times [i.e., increased *ad libitum*], and the result of this multiplication would be greater than time C. Now let the product of the multiplications of A, which are greater than C, be D; and let E be the product of the multiplications of B, as in the case of the magnitude D resulting from the multiplication of A. If this is so, the stone would traverse, if it does not cease moving ^z, distance E in time D. But since it was already supposed that D is greater than C, the motion of the stone would cease *before* it would traverse distance E. And if we had supposed that the distance of the stone from the earth [i.e., where the stone would normally stop moving] is the distance E, it would follow that the stone would remain suspended in air. But this is a stone, and thus something that is heavy would be resting in something light! This is obviously false. Now it is evident that this falsehood does not result from our hypothesis that the distance of the stone from the earth is the magnitude E, even if that magnitude be [assumed] to be greater than the distance of the region of the fiery element from the earth [i.e., the outermost region of the sub-lunar sphere]. For this [latter] assumption is from one aspect logically possible but from another aspect impossible, and in this context we have supposed it to be [logically] possible, not impossible. However, a possible but false [i.e., contingent] proposition does not entail a logical absurdity. Hence, the absurdity in question follows from the hypothesis that the stone has an intrinsic nature that necessitates the cessation of its motion after it has persisted in motion for some time. But whatever leads to an absurdity is itself absurd, as has been explained in the proper place. This example proves, therefore, that the stone does not have a nature that necessitates a cessation of motion, except upon the completion of its motion. This is what we wanted to demonstrate. ¹⁸

Indeed, our hypothesis that the distance of the stone from the earth is the distance E [i.e., some finite magnitude, no matter how great] is false, [but] possible in some sense, although impossible in another sense. For it

¹⁸In Aristotle's argument for the existence of the separate movers, it is assumed that if the mover were a force *in* a body, such a moving force would be finite (The full argument for this assumption is given by Aristotle in *Physics VIII*: 10, 266a 25-266b 5). Central to this argument is another principle implicit in Aristotle that the quantity of such an internal force is directly proportionate to the size of the body (Wolfson, *Crescas' Critique of Aristotle*, 269). Now Aristotle's argument for the existence of separate movers claims that since the alleged internal force is finite, the duration of its motive power is finite, i.e., its "motivity" must eventually cease. Therefore, if the body moves for infinite time, its mover must be "external" to, or "separate" from it. Gersonides rejects this argument and claims that there is no *a priori* reason why this internal motive force cannot continue indefinitely until the body reaches its natural place. In other words, there is no internal limitation on the duration of the motivity inherent in the body. Gersonides' argument, which is by no means transparent, I interpret as follows.

On Aristotle's theory of motion, the internal motive force of a body would keep the body moving for a definite temporal interval, say AC; then the body ceases moving, unless it is kept going by some external force. Let the distance traversed by this body be B and the moment at which it stops be C. Now, we can conceive the body to be capable of moving for a longer interval and over a longer distance. For the distance between the various "natural places" in the sub-lunar domain are not logically necessary; i.e., one could conceive of the distance between the fiery region and the earth to be greater than it actually is. So long as the distance is finite, there are no logical constraints on the exact length of that distance (The justification of this thought-experiment is given in subsequent paragraphs). Pursuing this thought-experiment let us now say that the body traverses a distance 3 times as great as B and for a corresponding greater temporal interval. Let this greater interval be D and its corresponding distance be E, where $E > B$ and $D > AC$. Now if, as Aristotle claims, the body must cease at C because its internal force has a fixed amount of energy, the body would stop *before* it traverses the distance E, which is on our thought-experiment greater than B. Hence, the body would be suspended in mid-air. Touati's summary of this argument is helpful (C. Touati, *La Pensée*, 309-10). *I have also been helped by the suggestions of Rabbi Nachum Rabinovitch of Yeshivat Birkat Moshe - Ma'aleh'Adumim.*

-147-

is not possible for the elements to be larger [in quantity] than they presently are, since of this [sub-lunar] matter there is no more than this amount;¹⁹ or, this is the case because the substances composed of these elements have in some sense a definite size. For example, a man [as a species] has a limited size, even if there is some latitude [among individuals within the species]. Hence, the amounts^{a1} of the elements must be limited in order that an [individual] man not receive too much of an influence from the preponderance^{b1} of the preponderant^{c1} element whenever that element is dominant; or in order that the man does not receive, for example, too weak of an influence from the preponderance of the preponderant element that is dominant at a certain time.²⁰ On the other

¹⁹Since the matter of the terrestrial domain, which is the world of the four basic elements, is limited in quantity -- for any surplus matter would be distributed between the spheres (as Gersonides will claim in Bk. 6, pt. 1, chap. 18) and the actual size of the terrestrial domain is limited in so far as it is bounded by the celestial spheres -- the amount of water, for example, in the sub-lunar domain is limited, i.e., there is an upper limit for its quantity.

²⁰Presumably Gersonides is referring to the notion that if the equilibrium of elements is upset and if one element dominates absolutely all the other elements, every composite substance would be seriously affected. Some compounds would receive too much of the dominant element, e.g., fire, and be deleteriously affected; others would receive too little of this dominant element and be harmed (Aristotle, *On Generation and Corruption*, II: 5-6; *Meteorologica*, IV: 1. Averroes, *Commentarium de De Generatione Et Corruptione*, 82-83 (Hebrew), 94-95 (English).

-148-

hand, it is not impossible for the elements to be greater either considered from the point of view of nature of the body or from the point of view of their forms, which are the cause of motion. The nature of the body indeed requires the elements to be finite in amount, since there cannot be an infinitely^{d1} large body; but^{e1} it is not impossible for it to be greater^{f1} than it is. [Similarly], the forms of the elements require that the elements too must be finite in amount; otherwise it

would be impossible for there to be contrary elements. ²¹ But they do not require that the elements cannot be greater than they are; e.g., the form of fire would still be fire even if the quantity of fire were multiplied considerably, and so too for the other elements.

Now if this is the case, it is evident that our assumption that the distance of the stone from the earth ^{g1} is some finite distance ^{h1} E, no matter how large, is [logically] possible, in the way we have construed it, i.e., from the perspective of the nature of the moving form. ²² And so we have demonstrated that it is impossible to maintain that in the elements there is a nature entailing the cessation of motion other than the fact that the object has completed its motion.

This can be proved in another way. If Aristotle's hypothesis were true, it would follow that the motion of the elements would decrease continuously, which is contrary to what is observed. For it *increases* so long as it continues [to move], as has been pointed out in the sciences. Thus, one and the same stone, whenever it falls from a higher place, has a greater impact upon a body which it encounters. Hence, it is evident that it is not the nature of the motions of the elements to cease before they reach their completions. ²³

When these points have been established, i.e., when the proportion between the mover and the moved object is constant ⁱ¹ and there is no nat-

²¹Aristotle's chemistry requires a finite number of elements, since the composition of bodies involves the transformation into and out of contrary elements, or qualities. But if any element were infinite in amount, there would be no "room" for any other element contrary to it (Aristotle, *On Generation and Corruption*, II: 4-6; *Posterior Analytics*, I: 22).

²²Since the "moving form" -- or simply the form of the element responsible for and determining its motion -- remains the same no matter how large the body is (so long as the size is finite), the moving form remains the same no matter how *far* this body is from the earth so long as this distance is finite. Thus, the thought-experiment entertained a few paragraphs back is not a logical impossibility.

²³Gersonides seems to be alluding to the classical experiment of Strato on acceleration and increased momentum cited by Simplicius in his commentary on Aristotle's *Physics* (Simplicius, *In Aristotle's Physicorum*, ed., Diels 1895, p. 916. Touati, *La Pensée*, p. 310). *It should be observed, however, that Gersonides is not explicitly concerned here with acceleration but with the duration of falling bodies. Yet he does recognize that the impact in the case of the body dropped from a higher place is greater than the impact of the body dropped from a lower place. To Strato and the later medievals, including the early Galileo, this suggested the notion that acceleration was a function of distance. Galileo eventually replaced this equation with the idea that acceleration is a function of time (cf. M. Clagett, *The Science of Mechanics in the Middle Ages*, (Madison, 1961), 545-46).*

ural motion in the moved object contrary to the motion [imparted by the mover], it is not necessary that the motion must cease. Now it is evident from the nature of the heavenly body that it has no contrary; hence, it does not experience any kind of change, except motion in place. Nor is it heavy or light; hence it does not have a nature whereby it could move in a way contrary to the motion in which it does [in fact] move. It is clear that even though it is assumed that the [moving] form of the spheres is an internal force, it does not follow that their motions must cease. For the proportion between the mover and the moved object always remains constant ^{j1}, since the latter does not change; and the moved object has no natural motion contrary to the circular motion it exhibits since it is neither heavy nor light. Rather, its motion is necessarily

uniform. It is therefore clear that [Aristotle's] argument is not adequate to prove that the movers of the heavenly bodies^{k1} are separate.²⁴

Moreover, Aristotle's [other] argument for the existence of an unmoved mover i.e., when two things are compounded together such that one of them exists separately, the other also exists separately -- is not adequate.²⁵ It has indeed been proven in the sciences that whatever functions as matter can be separated from whatever functions as form: but the form cannot be separated from that which serves as matter for¹¹ it. Hence, it does not follow from this argument that there exists a [separate] unmoved mover; for it is possible that there be a thing that is moved but does not itself move [something else], since that which is moved serves as matter for the thing that moves it. But this does not entail that there exists a mover that does not itself move; for the mover serves as form to the moved object, and whatever serves as form cannot be separated from

²⁴Gersonides' refutation of this Aristotelian argument for the existence of separate movers suggests the hypothesis that Gersonides anticipated the notion of inertia in classical physics. According to the latter, a body in motion continues in its motion along a straight line with uniform velocity unless acted upon by a force. It should be noted *ab initio* that Gersonides' example is really a case of a *free fall*, where, as he remarks, the body increases in velocity. But in so far as he recognized the possibility that bodies have no inherent limitation on the duration of their motion, he can be regarded as having made a step, at least, towards the inertial principle of Descartes and Newton [Touati, op. cit., 311-14. A.C. Crombie, *Medieval and Early Modern Science, II* (New York, 1959), 64-73].

²⁵Aristotle, *Physics, VIII: 5*, 256b 15-24; *Metaphysics, XII: 7*, 1072a 24-25; *On the Soul, III: 10*, 433a 11-17. In these passages Aristotle does not use the language of composition. Averroes and Maimonides, however, do (Averroes, *Long Commentary on the Metaphysics*, Arabic, 1588- 1591. Genequand, 146-48. Maimonides, *Guide, II: 1*). Perhaps both Maimonides and Averroes were following Themistius who explicitly formulated this argument in the language of composition in his *Paraphrase of Aristotle's Metaphysics*, Book Lambda (*Themistii in Aristotle's Metaphysicorum Librum Lambda Paraphrasis*, Hebrew 16, Latin 18. See also H. Wolfson, "Notes on Proof of the Existence of God in Jewish Philosophy", *Hebrew Union College Annual, 1* (1924) 575-96. S. Pines, *Some Distinctive Metaphysical Conceptions in Themistius' Commentary on Book Lambda and Their Place in the History of Philosophy*, (177-204).

the matter of which it is the form within the domain of sub-lunar phenomena. For example, the sensitive soul serves as form to the nutritive soul; but whereas the former cannot exist without the latter, the latter can exist without the former in plants.²⁶

This argument appears in the *Metaphysics* in a more satisfactory form, but it is still inadequate. In Book XII he says the following: "It is necessary that there exists something that moves [something else] without itself moving, since that which is itself moved exists and [that which] moves [something else] also exists, which is intermediary. Hence, that which moves [something] but is not itself moved also exists."²⁷ Our interpretation of this passage is as follows. It is necessary that there exists something that moves [something else] without itself moving, since that which is itself moved exists and [that which] moves [something else] also exists, which is intermediary.' This means that the latter [i.e., the intermediary] requires a prior mover in so far as it moves [something else] and that it moves [something else] while it is itself moved. And since it is impossible to extend the [series] of causes infinitely in this way, (i.e., there exists *ad infinitum* another mover for every mover) -- for if there is no

²⁶Here Gersonides argues that in the domain of terrestrial substances all forms are necessarily linked to matter, and thus are inseparable from matter. To illustrate this general principle he uses an example from Aristotle himself:

animals have both the sensitive soul, or form, and the vegetative (i.e., nutritive) soul, or form; plants, however, only possess the vegetative form. Now relative to the former the latter function as matter, i.e., plants are lower on the scale of being than animals, and thus are like matter to animals. Yet, the vegetative form exists without the sensitive form, but not conversely (Aristotle, *On the Soul*, II: 4-5).

Gersonides applies this general principle to motion. Just because there are things (a) that are moved by others and move others and other things (b) that are moved but do not move anything else, it does not follow that there are things (c) which move other things but are themselves unmoved. Thus, the thing that is moved but doesn't move anything else is like matter to that which moves it, which then is like form to it. But it doesn't follow from this that there is a thing that moves other things, i.e., there exists a form, which is itself unmoved and hence separate from matter. For as mover it is form, and the form cannot be separated from that of which it is the form.

²⁷Aristotle, *Metaphysics*, XII: 7, 1072a 23-25. Genequand, *Ibn Rushd's Metaphysics*, 147 ff.29. Aristotle, *Metaphysics*, XII: 7, 1072a 26-30. Maimonides, *Guide*, II: 4.

-151-

first there is no intermediary, as has been explained in Book I of the *Metaphysics* ²⁸--, it is evident that the series must terminate in a mover that is unmoved.

Now it could be objected that it does not follow from this that this mover is separate [i.e., incorporeal], but it can be a material form, since the latter does not itself move when it moves [something else]. For example, an image that moves an animal to move toward something does not itself move in that motion ²⁹Accordingly, it could be said that this argument [of Aristotle] does not entail that the first mover is separate.

It is therefore [clear] that these arguments ^{m1} are not adequate. We have attempted to clarify these important issues in such a way that no person of reflection would have any doubts; for it is not proper to base these important issues upon weak premises. Moreover, our explanation is more essential and pertinent to this question than the one given by Aristotle. This is evident.

²⁸Aristotle, *Metaphysics*, II: 2, 994a 15 ff.

²⁹Aristotle, *Metaphysics*, XII: 7, 1072a 26-30. Maimonides, *Guide*, II: 4.

-152-

CHAPTER VII

LET us now examine whether with respect to these separate intelligences the effect apprehends its cause and conversely, on the assumption that some of them are causes of others, as was maintained by some of our predecessors; or is it the case that the effect cannot apprehend its cause and ^a the cause cannot apprehend its effect? ¹

We have previously shown that the act of knowing, the knower and that which is known are in the [separate] intelligences numerically one. Now, if it is said that the effect [i.e., the separate intelligence caused by another separate intelligence] apprehends its cause, it would follow that what it apprehends of the cause is its cause. And since it seems that in an analogous fashion the cause also apprehends its effect, as in the case of the master craft and subordinate crafts, it would follow that there would be no difference between cause and effect; for the cognitions of the cause are present in the effect as well. Since the intelligences^b are constituted by their cognitions,² the cause and the effect would be on the same level. But since intelligences that are on the same level are numerically one, the cause and the effect would be numerically one. This is, however, obviously absurd. Moreover, someone who maintains that the intelligences are [arranged] causally makes this claim in order to account for their numerical diversity. But it is clear [from the above argument] that they do not possess numerical diversity if they are described in this manner [i.e., causally].

But the claim that the cause does not apprehend its effect and the effect does not apprehend the cause is devoid of reason. For if the effect does not apprehend in some way the cause, it would not apprehend itself in a perfect manner, since it is an effect and it does not [on this hypothesis] know this fact. And since it is the nature of the intellect to have perfect knowledge of itself, it is clear that it must know that it is an effect. Hence, it must have some knowledge of its cause. Analogously, if the cause has no knowledge of its effect, in what sense is it the cause of the effect? Would that I knew! In short, it is evident that when an intellect is a cause, it is a cause only in so far as it knows what emanates from it and makes that which emanates from it in the best manner possible^c with

¹Maimonides, *Guide*, II: 4 and 11. Averroes, *Tahāfut al-Tahāfut*, *Third Discussion*.

²Gersonides, *The Wars of the Lord*, vol. 1, Bk. 1, chap. 2, p. [117](#), n 21.

respect to the purpose it has intended. Accordingly, it would seem that the cause must know its effect. If this is so, we are now in a quandary, no matter which hypothesis is accepted!³

A solution of this dilemma is the suggestion that the effect has *imperfect* knowledge of its cause; for it apprehends the latter in so far as it knows that it is itself caused. Since causes and effects are correlative entities, the effect has in this sense^d knowledge of its cause, albeit an imperfect knowledge; for it knows only that it is an effect. On the other hand, [what] the cause knows of the existence of its effect is more perfect than the existence that the effect [itself] possesses.⁴ Thus, that which the cause knows of the effect is not identical with that which the effect knows of itself. This will become clear from the following. It will be shown later^e that the object of knowledge of the intelligences is the law, order, and rightness of existent things. Thus, since it is evident that in this law there are parts of the whole that function as matter [whereas the whole functions as the form], that which is known by the effect is related as matter to that which is known by the cause. The cause apprehends, however, this part in terms of the whole, of which it is the form, and the effect apprehends this part as such [i.e., as a particular item], but knows that the existence of this part is the effect of some other^f thing. For example, the master-craft in building knows what the subordinate crafts are to do in so far^g as what the latter do is concerned with the parts of the house -- as for example, the form of the stones which the stone-cutters make, or the forms of the bricks or beams made by the respective crafts. But the subordinate craftsmen need not know these parts as parts of a [whole] house; rather they know these parts as such [i.e., as particular items]. It is possible that they also are aware of the imperfection in what they do, i.e., that their activities are [directed] towards something else. This is the difference

between what the cause knows of the effect and what the effect knows of itself. From this it happens that the cause apprehends its effect in so far as it apprehends itself; for in this way the knowledge of what-

³These arguments are reproduced almost verbatim by Abraham Shalom, *Neve Shalom IV*, pt. 2, chap. 1.

⁴The last part of this sentence is difficult:



Similar phraseology occurs at the end of the chapter but with a somewhat better reading: instead of the present reading



(Vatican and Paris mms). Gersonides' point here is that what the cause, in this case God or some other supernal intellect, knows of its effect has a superior ontological status than that possessed by the effect itself. Since the cause knows its effects as elements in a comprehensive system, its knowledge of these effects is more perfect than the individual existence that the effects have (On this passage I have been helped by Professor Charles Touati).

-154-

ever is related as matter is included in the knowledge of whatever is related to it as form. We have explained this point in Books 1 and 2. ⁵

We have therefore indicated the way in which the separate intelligences apprehend their causes and their effects: the effect apprehends its cause only in so far as it recognizes that it is itself an effect and that its existence is from another; whereas [what] the cause, in so far as it knows itself, knows of its effect is more perfect than the existence that the effect [itself] possesses.

⁵Gersonides, *The Wars of the Lord*, vol. 1, Bk. 1, chap. 4; vol. 2, Bk. 2, chap. 3.

-155-

CHAPTER VIII

LET us now determine whether [in fact] all the separate intelligences are causes and effects in the manner described by the philosophers; or none is a cause of another; or whether they are all equally effects of one cause, i.e., the First Cause; or whether some of them are equally effects of the First Cause (i.e., they are not effects of each other), whereas others are effects of these secondary [causes]. ¹

Now it is evident that the object of apprehension of these separate intelligences, whose existence has already been proved, is the law, order, and rightness of the existents [of the sub-lunar world], since this law emanates from them to the sub-lunar world in the maximum possible degree of perfection via the heavenly bodies, as has been shown. Thus, it follows that they [i.e., the separate intelligences] do conceive of this plan. This can take place [in one of the following ways]: either each ^a intelligence conceives of this law in its entirety; or each one conceives of a part of this plan; or one intelligence conceives the whole plan and the others individually conceive of parts of the plan. Accordingly, it is evident that if ^b all of them are [hierarchically] related to each other according to [different] levels of perfection, as our predecessors have

thought, this can be the case in either of two ways. Either the lowest intelligence conceives of the plan for the lower existents in its entirety (and the same is true for all the intelligences), but the conception of this plan by the highest intelligence is related as the form to that which is conceived by the lower intelligence. Or, one could say that the lower intelligence conceives of a part of this plan, whereas the higher intelligence conceives of this part plus another part of the plan that is related as form to the part that is apprehended by the intelligence lower than it.² We have said that the higher intelligence apprehends the part that is apprehended by the lower intel-

¹The fourth position asserts that whereas some of the separate intelligences emanate equally and directly from the First Cause, others do not; these latter emanate from those that do derive directly from the First Cause, and thus can be said to be "secondary" causes of the last group of intelligences [Averroes, *Tahāfut al-Tahāfut, Third Discussion. Maimonides, Guide, II: 4. H. Wolfson, "The Plurality of Immovable Movers in Aristotle, Averroes, and St. Thomas", Harvard Studies in Classical Philology, 63 (1958), 233-53].*

²According to the first alternative, all the intelligences have some apprehension of the general plan of the universe but one intelligence has a perfect or complete knowledge of this plan. According to the second alternative, the intelligences have only partial conceptions of this plan, but the conception of each higher intelligence contains another part of this plan which supplements the conception of the intelligence beneath it.

-156-

ligence because it is impossible to have acquired cognitions pertaining to that which is related as form without acquiring cognitions pertaining to that which is related as matter. This is clear to anybody familiar with the sciences and with the previous portions of this treatise.

Now if the first of these alternatives is accepted, i.e., the lowest intelligence knows completely the law, order and rightness of the sub-lunar world, I am quite puzzled -- if it is of the nature of these movers to desire, on the basis of their conceptions, to move their respective spheres in such a way that this law for the sensible world is perfected -- how is it that each one of them is particularized such that it performs a *part* of this plan? [On this hypothesis], each of these intelligences has the *same* conception of this plan! Indeed, we see that the sub-lunar phenomena are perfected by that which emanates to them from *all* the heavenly bodies and that what emanates from one heavenly body differs from that which emanates from another.

Perhaps it will be objected that they have a desire only for that for which they have an instrument to accomplish [a portion] of this plan; and since they have an instrument only for a part of this plan, that which emanates from them is only this part by virtue of which they are particularized.³ We claim that this is not the way in which nature operates, namely, there are active powers that are not endowed by nature with the instruments by virtue of which they [exercise these] powers. In general, since we attribute conception to the intellects because of what we see of their influence, it is not proper to grant them conception except in terms of that which is implied by what is observed of their activities. For we always infer the nature of a form from the activities determined by the

³In the previous paragraph Gersonides argued that if the universe is hierarchically ordered according to ascending levels of cognitive perfection, then it is difficult to account for the diversity in the influences emanating from the various separate intellects, if it is claimed that each of these intellects has a complete apprehension of the plan for the sublunar world. The defender of this latter claim now replies that the influence of each of these intellects is

particularized by the unique instrument that each possesses for the accomplishment of this influence, i.e., the planet or star. In other words, even though the separate intelligence moving the sphere of Jupiter apprehends the complete plan of the sub-lunar domain, as does the separate intelligence moving the sphere of Mars, each of these intelligences has a specific influence upon the terrestrial world by virtue of the fact that each exerts this influence through a particular heavenly body. That is, the objector distinguishes between the knowledge possessed by the separate intellect of this world -- which is general -- and the influence this intellect has upon this world -- which is particular. Perhaps the following analogy will be helpful. The several captains of the division know the complete plan of the battle, but each has a specific tactical assignment: Captain A will use artillery; Captain B will employ tanks, etc. The equipment then serves to differentiate their roles in the battle-plan.

-157-

form, as is mentioned in *On the Soul*.⁴ Hence, it is not proper to grant them conception except with reference to what we observe of their activities ordered by them.⁵

Moreover, if it is asserted that each intelligence apprehends completely the law, order and rightness of the sub-lunar world, then each one of them will apprehend that by virtue of which this plan is a unified [system], i.e., that which functions as the form and perfection [of this plan]. But if this is so, would that I knew what is the thing that is apprehended by the superior intelligence that is not apprehended by the inferior intelligence and that is the form [and perfection] of that which is apprehended by the inferior intelligence?⁶ For if we were to assume that this thing is its apprehension of [the] *manner* of the emanation of its activities as they are necessitated by the law for the sub-lunar world, then if it is [further] admitted that this [knowledge] is related as form to the plan deriving from these activities (an assumption that is plausible), this would be related as form to a particular *part* of this plan; and this part would emanate from the intelligence via the heavenly body. But it would not be related as form to the conception of the law, order, and rightness of the sub-lunar world *as a whole*. If, on the other hand, it is not admitted that what is apprehended by the superior intelligence is related as the form of what is conceived by the inferior intelligence with respect to the aforementioned apprehension but that something else is [alleged] to be the form of that conception of the inferior [intelligence], I have no idea as to what is that other thing! It is impossible for someone to construe this [point] in an acceptable sense, even if he is willing to fabricate theories without consulting the relevant^c sense-experience. Accordingly, it is evident that it is not proper for a person of reflection to claim that all of these intelligences apprehend completely the law, order and rightness of the sub-lunar world.

But if it is suggested that all of them are [arranged] causally such that

⁴Aristotle, *On the Soul*, I: 1, 402 b 12 - 403 a 2.

⁵The first alternative has been shown to be inadequate because it cannot account for the empirical fact that the influences of the heavenly bodies are particularized, e.g., the moon influences moisture and the tides. There is then on this hypothesis a disproportion between the generality of the conceptions of the intelligences and the particularity of their actual influences. Since the influence is particularized by the instrument, i.e., the heavenly body, what point is there in separate intellects having a general plan of the whole system? Indeed, we only know that these intelligences have a conception of the plan from the *particular* influence they have. Thus, their ideas of this plan, ought to be particular (Touati, *La Pensée*, 319).

⁶It was initially suggested that the highest intelligence apprehends the total plan in a more

perfect manner than the lower intelligences do. The question now is posed, wherein lies the perfection of its conception of this plan if they all apprehend this plan in its entirety?

-158-

the inferior [intelligence] knows of the law, order and rightness of the sub-lunar world what emanates from itself, whereas the superior [intelligence] knows that part of the plan which emanates from itself and in addition [apprehends] the conception of the inferior intelligence such that the order emanating from the superior intelligence is the form of the order emanating from the inferior intelligence, I wonder if it is from the conception^d conceived by the inferior intelligence that its activities are derived? Why aren't the very same actions derived from the superior intelligence, since it has been claimed that the latter possesses the conception of the inferior intelligence? In short, if the matter is construed in this way, the initial difficulty that was mentioned in our discussion of the preceding hypothesis will arise.⁷

Moreover, if, as the hypothesis claims, the conceptions of these intelligences are all [hierarchically] related to each other as [form] and perfection, it would follow that the activities from them would be so related; for the relationship between one conception and another conception is analogous to the relationship between that which emanates from one conception and that which emanates from another conception. But if those actions emanating from them are so related, i.e., that which emanates from the superior [intelligence] is the form of that which emanates from the inferior [intelligence], this must be so in either of two ways, each of which being absurd. The first way is that the heavenly body^e, through which the superior intelligence exerts its influence upon the sub-lunar world, moves the element which is related as form to the element that is moved by the heavenly body through which the inferior intelligence exerts its influence. The second way would be that the heavenly body, which is the instrument of the superior intelligence, produces the composite, which [in turn] is the form of the composite or of the simple [element] produced by the inferior intelligence.

Now on the first supposition, it would follow that there should be only four movers, since there are only four elements; but there are more than four movers, as has been demonstrated [by the study] of the stars and the spheres. Moreover, we observe that *one* heavenly body has an effect upon the preservation of [all] four elements and upon generated substances by virtue of its four periods that are generated by its movements. For example, in the summer [elements] of fire and air prevail because of the nearness of the sun to us; whereas in the rainy season the [elements] of water and earth prevail because of the sun's remoteness from us. Thus, it is clear that it is impossible to assign one element to one heavenly body in the manner [previously suggested], since each one of

⁷How are the conceptions of the various Intelligences to be differentiated?

-159-

the heavenly bodies has an effect upon all the elements, even if their influences are different, as can be seen in their respective cases. And if it is suggested [according to the second supposition] that some of them [i.e., the separate intellects] move the elements according to their [various] levels [of perfection], whereas others move the composites formed from the elements according to their [various] levels [of perfection], such that in this way that which emanates from the superior intelligence is the form of that which emanates from the inferior, the aforementioned difficulty would arise when it was assumed that [the intelligences are] movers of the elements,

i.e., each one of the [intelligences] would have an effect upon all ^f the elements, which is incompatible with this hypothesis.

This hypothesis also entails that the number of movers corresponds to the number of elements and their compounds, which is clearly false; for the number of elements and their compounds is many times greater than the number of these movers. Furthermore, if this were the case, [i.e., the second way] the preservation of one compound would be assigned to one of these movers only; but observation reveals that this is not so. For example, we see that all [the movers] participate in the preservation of man, a fact that cannot be doubted by anyone who is a bit familiar with astrology. But this is contrary to this hypothesis. In conclusion, if we were to enumerate all the difficulties that ensue from these hypotheses, we would need a long book; hence, the difficulties just mentioned will suffice.

Now when it has been established that that which emanates from [the intelligences] with respect to their actions is not related as the perfection of that which emanates from the other movers [i.e., intelligences], and since it is evident that if their conceptions were related in this way their actions would be so related, it is evident that their conceptions are not related to each other as perfections [of each other]. It has been therefore demonstrated that these intelligences are not *all* related to each causally, as has been claimed by some of our predecessors. ⁸

But if we allege [as does the second hypothesis] that no one of these intelligences is a cause of another, it will be difficult to account for the motion of the [auxiliary] spheres that do not have any star or planet. ⁹ It would appear that their motions are for the [sphere containing a] heavenly body, and that no activity emanates from themselves as such [since they are without any planet or star]. Accordingly, it is proper that we say that since [some of] the spheres of one planet are subordinate to the

⁸Hence, the first of the four theories mentioned in the opening sentence has been shown to be false, no matter how it is interpreted.

⁹Gersonides is referring here to those spheres that in Aristotelian astronomy are required to explain the observed motions of the planets but are themselves empty, or "starless" (Aristotle, *Metaphysics*, XII:8, 1073b 18 ff. J. L. E. Dreyer *A History of Astronomy From Thales to Kepler*, 90).

sphere having the planet, their movers are effects ^g of the mover of the sphere having the planet, and it is this latter mover that gives the former movers their conceptions by virtue of which the movements of these [auxiliary] spheres are derived. ¹⁰

On the other hand, whether there is one intelligence that is the cause of all the other separate intelligences; or whether none is the cause of the others but each one of them apprehends a part of the law, order and rightness of the sub-lunar world, no one of which apprehending completely this plan -- these are questions that must now be examined. ¹¹

Let us say [at the outset] that since this law of the sub-lunar world cannot be achieved except through the [collective activities] of *all* the spheres, if there were no one intelligence that apprehends this plan in its entirety, the achievement of this perfection in the sub-lunar world from the various spheres would be fortuitous. This is similar to the different crafts, where it would be impossible for one piece of work to be accomplished by them collectively, unless they were subordinate to one craft which orders the activities [of the others] such that from their

collective activities one piece of work is achieved. This is obvious. Thus, it is necessary that this plan [for the sub-lunar world] be arranged for them by means of a superior cause which supervises them and what they accomplish together [of this plan]. Hence, these movers emanate from this cause in such a way that the law, order, and rightness of the sub-lunar world can be achieved in the best manner possible. Nevertheless, it has not yet been established whether this first cause is one of the movers of the heavenly bodies or something other than these movers. This question shall be discussed later. ¹²Accordingly, it is clear that the movers of spheres having a heavenly body are causes of those movers of spheres which are subordinate to them ^h. [The second hypothesis has therefore been refuted.]

However, [with regard to the claim of the third hypothesis that] the

¹⁰The case of the starless auxiliary spheres is therefore a counter-example to the second hypothesis, which claimed that none of the separate intelligences, or movers of the spheres, is a cause of another intelligence. For, in so far as the auxiliary sphere is subservient (meshoret) to a sphere with a star or planet, its mover is the effect of the latter's mover. Thus, at least *some* of the separate movers are causes of others (Touati, *La Pensée*, [323](#)).

¹¹Evidently Gersonides is not finished with the second hypothesis. For the defenders of that view could still argue that the case of the auxiliary spheres is special; after all, they are just *auxiliary* spheres! With respect to all those spheres containing a planet or star, i.e., "regular" spheres, the defenders of the second hypothesis would still claim that no separate intelligence is the cause of any other intelligence; rather, each is the intelligent emanating cause of only *one part* of the sub-lunar plan.

¹²This is one of the controversies between Avicenna and Averroes, the former distinguishing between the First Cause and the immovable movers of the heavenly spheres, the latter identifying the First Cause with the mover of the outermost sphere (H. Wolfson, "Averroes' Lost Treatise On the Prime Mover," *HUCA, Part I*(1050-51), 683-710). Gersonides will discuss this question in chap. 11.

movers of the spheres containing heavenly bodies are all equally effects of one of these movers, whether one of these movers is the First Cause or if no one of them is the First Cause (as will be proved to be the case later) -- in either case all of them are equally effects of the First Cause; i.e., no one of them is a cause of another, as has been demonstrated earlier [in this chapter]. Hence, each one of the movers of the spheres having heavenly bodies apprehends the part of the sub-lunar plan concerning which its activity is particularized. The First Cause, [however,] apprehends the law, order and rightness of the sub-lunar world in so far as it is a unified system. In addition, it apprehends the way in which its effects derive from these movers; for this is properly an object of knowledge for it, since these movers have been endowed with the greatest possible perfection, so that there should emanate ¹ from them what [in fact] does emanate. This cannot be attributed to chance, as has been explained previously.

But with respect to the question as to which of the spheres auxiliary to the sphere having the heavenly body is the more noble, it would seem that the one slowest in motion is the more noble. For it supervises a thing for a longer time than a body having faster motion. Moreover, the emanation from the slower moving spheres arrives by means of a less activity [i.e., motion] than the emanation coming from the faster spheres.

Concerning the question as to which of the spheres of the heavenly bodies is the nobler, there are two criteria. First, their differences with respect to their number of bodies and the size of the

body with respect to its sphere. Second, their differences in velocity and the number of subordinate instruments ¹³ possessed by them. For (with respect to the first criterion) a sphere having more bodies is more noble, since that which emanates from it via one and the same motion [consists of] a great number of activities resulting from the many bodies contained within the sphere. Thus, it is clear that the sphere of the fixed stars is more noble than any of the other spheres by virtue of its many stars. For the same reason the spheres of the sun and of the moon are more noble than the other spheres having only one body [i.e., the five planets], since these bodies are greater in size relative to their spheres than the planets are to their spheres. Moreover, the sphere of Venus is more noble than the spheres of Saturn, Jupiter, Mars, and Mercury; and the sphere of Jupiter is more noble than those of Saturn, Mars, and Mercury. By means of this proof it can be shown which among the remaining planets is the nobler in this respect [i.e., the size of the planet relative to its sphere]. It can be

¹³*Ha-kelim ha-meshortim*. These instruments seem to be the auxiliary spheres.

-162-

shown from this that the sphere of the sun is more noble than the sphere of the moon because its light is always great, whereas the light of the moon is only complete at the time of opposition [i.e., the full moon]. Moreover, the moon receives its light from the sun.

With respect to the criterion of slowness of motion, it is clear that the sphere of the fixed stars is the most noble, since its longitudinal motion is the slowest of all the longitudinal motions amongst the heavenly bodies. In this regard the sphere of Saturn is more noble than the sphere of Jupiter^j, and the sphere of Jupiter is more noble than the sphere of Mars, and the latter is more noble than the spheres of the sun, Venus, and Mercury; whereas the spheres of the latter bodies are more noble than the sphere of the moon.

From the aspect of the least number of instruments, it is clear that the sphere of the fixed stars is the most noble; ¹⁴ then comes the sphere of the sun^k; then the spheres of Saturn, Jupiter, Mars, and Venus; then the sphere of Mercury; and lastly, the sphere of the moon. This completes [the matter], unless spheres are added for these bodies because of latitudinal motion. But if spheres were added in the way [just] mentioned, then the moon would be equal in perfection to Saturn and Jupiter; then would come Mars and Venus; finally Mercury. And thus it has been^l demonstrated that the sphere of the fixed stars is the most perfect of all spheres in every one of these respects.

This can be shown in another way. As it has been explained, the sphere of the fixed stars in some sense gives to the other spheres their activities in so far as the latter spheres are in different regions of the former sphere. ¹⁵ Hence, it is evident that the sphere of the fixed stars is the most noble of all the spheres and thus encompasses them all. ¹⁶

¹⁴The more subordinate spheres required by a planet the less simple is its motion; hence it is less noble. The sphere of the fixed stars has the simplest motion and thus requires the fewest subordinate spheres (Genequand, *Ibn Rushd's Metaphysics*, 173).

¹⁵The planets occupy different positions within or amongst the fixed stars. According to their positions relative to the stars, the influence of the planets varies.

¹⁶Gersonides has not discussed the fourth hypothesis mentioned in the first sentence of this chapter. It will turn out that this position is his own. See chap. 13.

CHAPTER IX

AFTER having demonstrated that each one of the movers of the heavenly spheres apprehends that part of the plan of existent things which uniquely [or specifically], emanates from it, it is appropriate that we [now] investigate whether the mover of the sphere apprehends what emanates from it by virtue of the mixture that is generated from the ray [*nitzotz*] of the star in its sphere together with the rays ^a of the other stars; or does it [just] apprehend what uniquely emanates from it?

Now, if we assume that the mover of the sphere does not apprehend what follows from the mixture which results from the ray of its own star together with the rays of the other stars, then it would not apprehend what emanates from itself. But this would appear to contradict what was proved concerning these movers, i.e., it was demonstrated that it is proper for each one of them ^b to apprehend that which emanates from itself. ¹On the other hand, if we assume that the intelligence does apprehend what follows from these mixtures, it would then necessarily have knowledge of what emanates from the stars with which [its own ray] is mixed, and it would have the conception that *all* of the movers have. It would follow from this that each mover would apprehend the law and order of existent things completely. But this has been previously proved false! ²

How it follows from the assumption that if the intelligence apprehends what follows from the mixture it [also] apprehends what emanates from the [other] stars with [whose rays] its [own ray] is mixed, -- this will be clear from the following. ³Since the mixture is a composite of the

¹If a separate intelligence, or mover, of a celestial sphere does not apprehend the result of the mixing of rays coming from its own star together with the rays of the other stars, then it would appear that it does not apprehend what emanates from itself at all. But in chapter 8 it was proved that each mover does apprehend what emanates from itself! So we seem to have a contradiction.

²In chapter 8 it was demonstrated that each intelligence, or mover, of a heavenly sphere apprehends only a *part* of the plan for the sub-lunar world. Accordingly, the hypothesis that these movers have an apprehension of the result of the mixing of the rays is inconsistent with this conclusion. But the previous hypothesis claimed that if the intelligence does not have such an apprehension, it doesn't have any apprehension of its own influence upon the sub-lunar world! We seem to be confronted here with a dilemma: each intelligence would seem to have either no apprehension at all of its own part in this plan or a complete conception of this plan.

³Now Geersonides will try to show that to know the result of the mixing of the rays is to know also the influence that each mover has upon the earth. And this means that each mover would apprehend the *whole* plan for the sub-lunar domain.

natures ^c of the simple elements from which it is composed, and since the nature of the elements in the composite is a function of the [specific] proportion of the mixture, it follows that whoever knows the nature of the mixture knows the nature of the simple [elements] from which the mixture is composed and their [specific] proportion in the mixture. Now it would seem that each of the movers of the spheres apprehends that which emanates from it without mixture. Indeed, [it is the case that such movers] do not apprehend what emanates from them by means of the

mixture. This type of knowledge [i.e., knowing the mixture], however, belongs to the First Cause alone, from whom these movers and their spheres emanate in such a way that the law, order and rightness of existent things is achieved. The situation here is the same as it is in crafts that are subordinate to one [master]-craft: each [such subordinate] craft apprehends what is assigned to it but not how its craft is related to the other subordinate crafts, whereas the master craft does apprehend this relationship. So too in our present case: [i.e., only God has a complete apprehension of the relationships amongst all the separate intelligences]. Herein is demonstrated the vast difference between the conception of the First Cause and the conception of these movers. The latter apprehend only a part of the law, order and rightness of existent things, and this is the part that emanates from them [specifically]: indeed, they do not apprehend this part perfectly, since they do not apprehend the mixture. The First Cause, however, has a perfect apprehension of the entire law, order, and rightness of existent things. From this it is clear, together with our previous results in Book One of this treatise, ⁴ that there is no relation [i.e., comparison] between the conception of the First Cause and the conception of these separate movers.

⁴Gersonides, *The Wars of the Lord*, vol. 1, Bk. 1, chap. 7. See also Bk. 5, pt. 3, chap. 11.

CHAPTER X

IT is proper to consider the question whether the ratio between the velocities of the heavenly bodies can be incommensurable or must they be commensurate. ¹

Since it has already been shown that these movements are ordered by [and derive from] an intellect so that the terrestrial domain is perfected and that it is the intellect that orders them *in order* that sub-lunar phenomena are perfected, it is evident that this ratio cannot be incommensurate. If this were the case, the [influence] resulting from the mixtures ^a [of their illumination] would not be known; for [on this hypothesis] the heavenly bodies would never return to their present ratio relative to each other, since their motions relative to each other would be [on this hypothesis] incommensurate. Thus, from these motions indefinite ratios would result; and whatever is of this kind cannot be known, since knowledge of something implies definiteness and determinateness. ² But these ratios are necessarily knowable, [at least by God] ³; hence, they must be commensurate.

If it is objected that the heavenly bodies will return *approximately* to their positions [i.e., their velocities are nearly commensurate], and thus no perceptible impression would result from this [alleged] variation, it should be realized that when the amount of this is repeated many times,

¹The Hebrew term for commensurate, or rational number, is *mispar medabber*; the word *medabber* renders the Greek λογικός or ῥητός, "rational"; in Arabic the corresponding term was *mantiqah*, (G.B. Sarfatti, *Mathematical Terminology in the Hebrew Scientific Literature of the Middle Ages*, (Hebrew) (Jerusalem, 1966), 180. The Greek, Arabic, and Hebrew terms all originally connote speech. This problem of the commensurability of planetary ratios was discussed by Averroes in his *Epitome on Generation and Corruption* [*Averroes on Aristotle's De Generatione*, edited and translated by Samuel Kurland, (Cambridge, MA., 1958), 137-38, Hebrew text, 126-27. I owe this reference to Edward Grant, the editor of Nicole Oresme's, *De proportionibus proportionum and Ad pauca respicientia* (Madison, 1966), 115-16]. Averroes declares that whether or not the ratios are commensurate is an undecidable question,

since the empirical data provided by astronomy are inconclusive.

²Aristotle, *Posterior Analytics*, I: [24](#), [86](#) a [4](#) - [7](#).

³From the fact (proved in the preceding chapters) that the order of the sub-lunar world is known by at least some separate intellects, it follows that the motions of the heavenly bodies, which are in part responsible for this order, are expressible by a rational number. If the ratios of these motions were incommensurate, there would be no definite, precise knowledge of these motions, which would mean that no separate intelligences have a precise conception of this domain. And this would imply that the order of the sub-lunar world is less regular and perfect than it in fact is.

-166-

a perceptible amount [i.e., impression] does result, and hence the definite ratios which are [alleged to be] known by the First Intellect, would be mixed up [and thus not knowable]. Thus, it is evident the ratio of the velocities of the heavenly bodies is commensurate.⁴

⁴A younger French contemporary of Gersonides, Nicole Oresme (ca. 1320-1382) discussed this question in detail in his *De proportionibus proportionum and Ad pauca respicientia*. Oresme's main concern was to preserve divine and human freedom against the challenge of astrology. Astrological prediction assumes that the ratios of the heavenly movements are precise or almost so; hence, these movements can be expressed by commensurate ratios. But if this is the case, human action would seem to be thoroughly determined. Oresme wished to preserve freedom at all costs. So he rejected astrological determinism and the thesis of commensurate ratios. For Oresme the ratios amongst the celestial movements are incommensurate; hence, no precise astrological predictions can be made (Oresme, *De proportionibus proportionum*, 61-65, 109-11). Gersonides, however, reached a different conclusion from a different set of premises. He maintained that these ratios are commensurate because incommensurability would imply disorder in the sub-lunar domain, and hence no knowledge of this world would be possible for any of the separate intellects. Nevertheless, Gersonides did believe in human freedom (*Wars of the Lord*, Vol. 2, Bk. 3). To defend freedom Gersonides argued that (a) astrological predictions were not always precise or infallible, and (b) more important, human choice can contravene the astrological order (*Ibid.*, Bk. 2, chaps. 2 and 6).

-167-

CHAPTER XI

LET us now examine whether the mover of the sphere of the fixed stars is God (may He be blessed) or whether God is superior to this mover. Some^a of our predecessors have said that God is not the mover of the sphere of the fixed stars, whereas others have said that He is the mover of this sphere.¹ There are arguments in behalf of both theses. The thesis that the mover of the sphere of the fixed stars is God may be supported by the following argument.

First, since we observe that these movers move the spheres in such a way that whatever is [determined by] the law for existent things emanates from them according to their conceptions [of this plan], it would seem that it would follow that God is the mover of some sphere; for He apprehends the law of the universe. Otherwise there would be a moving cause that has no activity. Averroes uses this argument in his commentary upon the *Metaphysics* and proves from it that the mover of the sphere of the fixed stars is God (may He be blessed) and he believes that this is the view of Aristotle.²

Second, we have already demonstrated ^b that there is no comparison between the movers of the other spheres and the mover of the sphere of the fixed stars. ³ For from the latter many activities are derived by virtue of its many stars and the mixtures resulting from their rays. Moreover, this sphere in some sense endows the other spheres with their respective activities. Now since these properties are befitting the First[Cause], it seems that the mover of the sphere of the fixed star is God (may He be blessed).

It can be shown, however, by another [kind of] argument that the mover of the sphere of the fixed stars is not God (may He be blessed). It has already been demonstrated that the mover of this sphere does not apprehend the law that derives from the other heavenly bodies, nor the mixture of their rays with its rays, nor the mixture of the rays of some of

¹This was a controversy between Avicenna and Averroes. Maimonides sided with Avicenna in distinguishing God from any of the movers of the spheres (Maimonides, *Guide*, II: 4). Averroes, however, identified God with the mover of the sphere of the fixed stars [H. Wolfson, "Averroes' Lost Treatise on the Prime Mover", *Hebrew Union College Annual*, 23, pt. 1(1950-51), 683-710].

²Averroes, *Long Commentary on the Metaphysics*, Arabic, 1644- 1651, *Latin 319 G-320 I*, 326 L-327. M. Genequand, *Ibn Rushd's Metaphysics*, 170-73.

³Gersonides, *The Wars of the Lord*, Bk. 5, pt. 3, chap. 8.

-168-

the bodies with those of the other bodies. ⁴ The First [Cause], however, must have knowledge of this law in its entirety, since the law derives from Him, and it is He that assigns each sphere a particular role in this law such that from them all this law will be achieved. This is analogous to a governor of a perfect city who assigns some men to one job and others to another job, so that from all of them the improvement ^d of the city will be obtained. If this were not the case ^e, this law deriving from all of them would not come about except by chance. [But] that this remarkable perfection [which is exhibited in the universe] could occur by chance is impossible. Thus, this perfection must be achieved from them by means of one cause that apprehends this plan in its entirety and is the cause of all these movers, as has previously been proved. But the mover of the sphere of the stars does not have this characteristic, as has been pointed out; hence, the mover of this sphere is not God (may He be blessed). ⁵

Furthermore, it is proper that the First [Cause] be the most perfect and noble being such that no comparison between it and anything else can be made. But if the moving of one sphere is attributed to Him, He would be related and similar to the other movers of the spheres. It is, however, inappropriate to assert [such similarities]. Moreover, since the universe in its entirety emanates from the First Cause, not just individual parts, it is not legitimate to link this cause with any particular heavenly body by means of which the plan for existed things emanates. Indeed, we point this out because it seems that the movers of the heavenly bodies are linked to their spheres in the same way as the acquired intellect is linked to a particular man, as we have pointed out in Book 1. ⁶

This argument dissipates the force of Averroes' argument from which he concludes that the mover of the sphere of the stars is God. For it does not follow from our assumption that God is not a mover of a particular sphere that there is a moving cause having no activity. ⁷ This would follow ^f if it had been asserted that the First Cause had no influence at all upon the movements of the spheres. But this is not entailed by our hypothesis; rather this hypothesis implies that the First Cause is in some sense the mover of *all* the spheres. For the movers move these spheres by virtue

of their conceptions of the law of the universe which is present in the soul of the First Cause, from which both they and their spheres emanate. Hence, their activities are continually derived from the First Cause. Moreover, this feature is appropriately attributable to the First

⁴*Supra*, chap. 9.

⁵L. Gardet, *La Pensée Religieuse D'Avicenne*, (Paris, 1951), [45 - 59](#), [158 - 59](#).

⁶Gersonides, *The Wars of the Lord*, vol. 1, Bk. 1, chap. 13.

⁷Averroes' first argument.

-169-

Cause, as we have said; for ^g, since the universe emanates from it as a whole and not just individual parts, it would not be proper for the First Cause to be tied to a particular body, among the heavenly bodies, by the means of which the plan of the universe emanates. Therefore, the activity of *all* these bodies is appropriately ordered by [or derived from] the First Cause. Now if this is So ^h, the First Cause is more truly active than the movers of the spheres; for it makes them active, and whatever endows something else with a certain attribute is more properly describable by that attribute than the thing to which it gives that attribute, as has been demonstrated by means of general principles. ⁸Hence, it is evident that God (may He be blessed) is truly the agent of the law, order, and rightness of existent things.

That God is continually acting with respect to all these things can be shown as follows. It has been proven [in chapter 9] that the apprehension by the movers of the spheres of the law, order, and rightness of existent things is very defective, since they know only a small part of this plan, i.e., that part which derives from them individually without mixture. Accordingly, since it is evident that their motions ⁹result from desire and conception and that this extraordinary continuous desire can not be [attributed] to them because of their defective apprehension of the plan for existent things, it is clear that they have this desire by virtue of their apprehension that this plan [which they perceive] is [only] a part of the complete plan, which is in the soul of the First Cause. Hence, they are always subservient to [the First Cause] and desire to perform their [respective] roles within this complete plan because of their extraordinary ⁱ desire for the First Cause. It is in this way that God (may He be blessed) is continuously active with respect to all creatures, and all knowers desire [to emulate Him]; for each one of them longs for its perfection to accrue to it, and this perfection is no other than the law [allotted] to it in the soul of the First Cause. ¹⁰

The argument claiming that God must be the mover of the sphere of the stars because the latter must have the properties befitting a First Cause is not valid. ¹¹Indeed, the reverse is true. It has already been shown that this mover does not have a complete cognition of the law of existent

¹⁰Maimonides, *Guide*, II: [4](#).

¹¹This is Averroes' second argument.

⁸Aristotle, *Metaphysics*, II: 1, 993b [24 - 28](#).

⁹Strictly speaking, the movers of the spheres do not move, or at least not essentially. But according to Wolfson, Aristotle's theory of planetary motion involves the thesis that the movers of the planets have accidental motion in so far as they participate in the motion of the outermost sphere [H. Wolfson, "The Plurality of Immovable Movers in Aristotle and Averroes," *Harvard Studies in Classical Philology*, LXIII (1958), 237].

-170-

things, which cognition must belong to the First Cause, as we have pointed out; i.e., the First Cause must have a cognition of the whole law, order, and rightness of the universe. And so it has been demonstrated that God (may He be blessed) is not the mover of the sphere of the stars, and the difficulties pertaining to this claim have been resolved. ¹²

¹²Gersonides agrees then with Avicenna and Maimonides (Thomas Aquinas, *Summa Contra Gentiles*, III: 23).

CHAPTER XII

IT is now appropriate that we determine, as best we can, which attributes can be properly attributed to God and which cannot, and how God is related to the movers that are derived from Him. It is obvious that the [proper] method in this inquiry is to know first what are God's actions and the way they are attributable to Him; for when we know this we shall know which attributes should be attributed to Him. ¹

It has been demonstrated that each one of the movers of the celestial bodies has a partial conception of the law, order, and rightness of the existent things, i.e., of that part [of the plan] to which its influence upon the earth is attributed, and that, since this law cannot be realized except by means of *all* of these movers, it must be arranged for them by a higher cause that supervises them and what results from their cooperative activities. Accordingly, these movers emanate from this cause in such a way that this law be realized in the most perfect manner possible. The First Cause, therefore, must have the most perfect conception of the law, order, and rightness of existent things. Hence, it apprehends this law as a unity; and this [unity] is the form [and perfection] of the [plan] because that which is apprehended is identical with the First Cause. For the intellect, the object of knowledge and the knower are necessarily numerically ^a one, as Aristotle has proved and which has been explained by us in Book 1. Thus, the First Cause knows itself, [i.e., its essence], and in knowing itself it knows all existents simultaneously in the most perfect way; for it knows them in so far ^b as they are all one thing, and this aspect is their state of perfection. And it is evident that the object of this act of knowledge is continuously attached to the First Cause, since the very existence of an intellect is necessarily tied to the act of knowing; for if the intellect were separate from the act of knowing at any moment, it would not be an intellect at that time, and that which is indestructible would be destroyed. It is evident also that the First Cause apprehends all ^c these objects of knowledge simultaneously, not one after the other; for if it did apprehend them one after the other, its essence would be continually changing and it would require memory. But all of this is clearly absurd. ²

¹Gersonides, *The Wars of the Lord*, vol. 2, Bk. 3, chap. 3. Maimonides, *Guide*, I: 51-66. Averroes, *Tahāfut al-Tahāfut*, 5th and 6th discussions.

²Aristotle, *Metaphysics*, XII: 7; *On the Soul*, 111: 5. Gersonides, *The Wars of the Lord*, vol. 1, chaps. 2 and 6. S. Pines, "Some Distinctive Metaphysical Conceptions in Themistius' Commentary on Book Lambda....", 181-85.

It is also evident that in God ^d the pleasure and joy in His knowledge is the most perfect, as Aristotle has explained. ³For knowing is pleasurable to the knower; and whoever knows more things and things of a superior sort has greater pleasure and joy. Hence, God's joy and pleasure in

what He knows is the greatest; for He apprehends all things and in the best possible way. The superior level of this joy can be appreciated if we compare, as Aristotle does, the intense joy experienced by us when we have some knowledge of the superior beings, to which pleasure the knowledge of corporeal substances cannot be compared, with the pleasure in this knowledge which must obtain in the First Cause. The joy experienced by us lasts but for a short time; for, since the soul is a unity, our intellect can isolate itself from [sensuous distractions] only briefly and with difficulty. ⁴If our knowing were continuous and uninterrupted our joy would be infinitely great; for there is no comparison between what encompasses ^e all time without difficulty and what exists only briefly and with difficulty. And if this knowledge [encompassed] all things in the best possible manner, the joy would be infinitely greater; for there is no comparison between that which we apprehend and that which the First Cause apprehends.

From this it can also be shown that there is no comparison between the joy in divine knowledge and the joy in the knowledge of the movers of the heavenly bodies. Accordingly, our ancient sages (of blessed memory) have said that the supreme joy is possessed by God; as it is said: "The joy is in His dwelling place." ⁵That is, supreme joy is at *the level of God*, for the terms "dwelling-place" and "place" are used in this sense. ⁶Accordingly, they maintain that our greatest ^f joy is in what we know of God. This is stated by David (may he rest in peace): "Thou makest me to know the path of life; in Thy presence is fullness of joy." ⁷For it is obvious that the greater the object of knowledge the greater is the joy in knowing it.

It is also clear that God is the most perfect *life*. ⁸For knowing is living, and he who has a greater share of knowing has a greater share of life.

³Aristotle, *Metaphysics*, XII: 7 and 9.

⁴Aristotle, *Metaphysics*, XII: 7, 1072b 13 - 29; XII: 9, 1075a 5 - 11.

⁵*Ha-simhah bim'ono* (*B. T. Ketubot*8a). The word *ma'on* is used in the Talmud to refer to one of the seven heavens (*T. B. Hagigah*, chap. 2). *The phrase here then has the meaning: true joy is in the heavenly domain.*

⁶As Maimonides had shown, the Hebrew term for place *maqom* can signify rank, or level (*Guide*, I: 8). Gersonides appears to have assumed this interpretation and now applies it to this rabbinic saying (Touati, *La Pensée*, 119).

⁷Psalms 16:11. The Leipzig text and the Vatican and Paris manuscripts have "*hodi'eni*" instead of "*todi'eni*".

⁸In describing the divine attribute of life Gersonides uses a different syntax. Whereas in the cases of knowledge and joy he uses the locution "God has knowledge," here he says literally "God is life": *hu ha-hayut ha-yoter shalem*. This expression corresponds closely to Aristotle's phrase *του + το [ζον αιδιον] γαρ ο θεός*: "for that [i.e., eternal life] is what God is" (Aristotle, *Metaphysics*, XII: 7, 1072b, 31).

Thus, a water-sponge ^g has the lowest degree of life, since the only knowledge it has derives from the sense of touch; whereas man is the most superior of all living creatures in the sub-lunar world, since he has the most knowledge. In short, knowledge is that whereby the living is differentiated from the non-living; hence, whoever has more perfect [or complete] knowledge has necessarily a more perfect life. From this it is clear that God (may He be blessed) is the most perfect life possible, since He is the most perfect knowledge. This implies that there is no comparison between His life and the life of creatures, just as there is no comparison between His knowledge and their knowledge. Hence, God is the life that is the most pleasurable possible.

It can also be shown that God is [of all things] the most truly described as "substance." For all substances are posterior to Him; and whatever is prior to a substance necessarily is a substance, since substance is prior to everything, as has been explained in the *Metaphysics*.⁹ In general, since the intelligible [form] of a thing that is a substance is itself a substance, and since God (may He be blessed) is in some sense the intelligible [form] of all existent things, He is necessarily a substance.¹⁰ We have said "God is in some sense the intelligible form of existent things" [in the sense] that He does not acquire this form *from* existent things, as occurs in human cognition. Rather, the reverse is true; for existent things emanate from this intelligible form, as artifacts emanate from the intelligible form of that artifact in the soul of the artisan.

Similarly, it can be demonstrated that God is [of all things] the most truly described as "existent." The term "existent" [*ha-nimtza*] is predicated of substance primarily and secondarily¹¹ of accidents, as has been proven in the *Metaphysics*; for accidents do not exist unless the substance,

¹⁰In this section Gersonides uses the term *muskal*, which has a variety of connotations in medieval philosophical Hebrew, as I have noted in vol. 1, p. 66, n. 4 and 110, n. 5. It has been customary to render this term and its Arabic original *ma'qul* by its Latin equivalent 'intelligible'. All these terms go back to the Greek *νοῦτόν*, that which is known by the mind at its highest and most perfect level (Aristotle, *Nicomachean Ethics*, 1174b 34. Plotinus, *Enneads*, III.2.1; IV.8.3). In this context Touati translates the term as "le concept" (*La Pensée*, 120). As an English rendering of this term Wolfson suggested "intelligible form" (Wolfson, *The Philosophy of Spinoza*, vol. 2, 26, 47); Pines gives "intellectually cognized object (or form)" (*Pines' translation of Maimonides' Guide of the Perplexed*, 1: 68, pp. 163-64). Since Gersonides will claim in the next section that God can be regarded as the form of all existent things, I shall use here the phrase "intelligible form" to express the idea that God is the *logos*, ratio, or formal structure of the universe. The analogy he makes with the artisan is a good one; the form of the statue in Rodin's mind is the form of the statue in the stone.

¹¹Literally, predication by priority [*beqedimah*] and posteriority [*be'ihur*]. Gersonides discussed this topic in Bk, 3, chap. 3 of *The Wars of the Lord* (vol. 2, p. 107 n.1). See also Aristotle, *Metaphysics*, VII: 6; IV: 2; V: 11, 1019a 2ff.

⁹Aristotle, *Metaphysics*, VII: 4-7; *Categories*, V.

in which they inhere, exists^h. In the same way it can be shown that the term "existent" is said primarily of God; for He exists by His very essence and does not acquire His existence from anything else, whereas all other substances acquire their existence from Him. It is quite clear then that God is more truly describable as "existent" than anything else; for whatever is responsible for something's having a certain attribute is more truly describable by that attribute. In short, since it is the form that makes a thing exist in the way that it exists, and since God is the form of all things from whom all forms emanate, it is clear that He makes all things in such a way that they are describable by the term "existent."¹²

Similarly, it can be shown that He is more truly describable as "one" than anything else. For it is the form that makes a thing one, since unityⁱ accrues to things from the form. Hence, the Torah describes God by these two attributes, i.e., existence and unity; as it is said, "Hear O Israel, the Lord our God, the Lord is one."¹³

In this regard Avicenna made a serious error: he thought that it is not proper to describe God by these two attributes, since he believed that existence and unity are supervenient accidents of a substance.¹⁴ Aristotle has, however, definitely shown the absurdity of this view in chapter 3 of

¹²Averroes, *Tahāfut al-Taliāfut, Fifth Discussion, Par. 302, p. 179.*

¹³Deuteronomy 6: 4. Gersonides derives the Tetragrammaton, or proper name of God, from the root *hayah*, "to be." Since God is the truly existent one, His proper name means existence (Maimonides, *Guide*, 1:61).

¹⁴Gersonides now adds something of his own to a philosophical debate that had been going on for several centuries, ever since Ibn Sina (Avicenna) had claimed that: (1) existence and unity are in general different supervenient accidental properties of a thing, except that (2) in God's case the existence and unity are identical with His essence. Accordingly, since in God existence and unity are not attributes distinct from each other or from His essence, it is not proper to describe God even as existent or as one, for these attributes *ordinarily* connote supervenient properties. Gersonides will now proceed to criticize this thesis. His argument pre-supposes the earlier critique by Averroes from whom he learned about Ibn Sina's doctrine, and perhaps also Maimonides' own version of the Avicennian thesis (Averroes, *Long Commentary on the Metaphysics*, Arabic, 310-15; Latin 66L-67L; *Tahāfut al-Tahāfut, Fifth Discussion, pp. 180-81 and Seventh Discussion, pp. 223-24. Maimonides, Guide, 1: 57).* *Throughout the subsequent discussion it is important to keep in mind that in rejecting Avicenna's doctrine, Gersonides wants to preserve God's absolute simplicity, i.e., divine unity understood as the complete absence of any internal compositeness or plurality. Even the mere thought that existence and unity are or could be supervenient properties accruing to a substance has to be avoided, for this might suggest in the case of God that He too "receives" these attributes from some external cause. Although Ibn Sina warded off this suggestion by his claim that in God existence and unity are identical with His essence, the fundamental Avicennian metaphysical distinction between essence and existence is misleading, and thus can generate other errors, of which some can be dangerous. So, Gersonides argues, let's nip the disease in its incipient stage.*

This subject has received a great deal of discussion. The following items are especially noteworthy: H. Wolfson, Spinoza, 1, 121-25. G. Vajda, Isaac Albalag, 34-50. A. Altmann, "Essence and Existence in Maimonides," Studies in Religious Philosophy and Mysticism, (London, 1969), 108-27. Fazlur Rahman, "Essence and Existence in Avicenna," Medieval and Renaissance Studies 4 (1958), 1-16. David Burrell, Knowing the Unknowable God (South Bend, 1986), chap. 2.

-175-

the treatise entitled "Gamma," which is Book IV of the *Metaphysics*. ¹⁵This is what he says:

"Since, however, unity and existence are one thing or both have one nature, each follows the other as beginning and cause do, [but] not as having the same definition (and there is no difference between them even if we make this supposition). For the phrases 'one man', 'existent man', ¹⁶and 'this man' signify the same thing; they do not signify different things when they are duplicated. It is well-known that the terms ^j'existent man' or 'one man' do not signify different things, since ^kthere is no difference between the

¹⁵In the original Greek text this passage is found in the *Metaphysics, IV: chap. 2, 1003b 22 - 32.* Since this passage is the focus of Gersonides' subsequent discussion, I shall cite here Aristotle's original according to the English translation of C. Kirwan in the new Oxford Clarendon Aristotle Series, edited by J.L. Ackrill (1971).

"Suppose it true, then, that which *is* and that which is *one* are the same thing -- i.e., one nature

-- in that each follows from the other as origin and cause do, not as being indicated by one formula (though it makes no difference even if we believe them like that -- indeed it helps). For one man and a man that is and a man are the same thing; and nothing different is indicated by the reduplication in the wording of 'he is one man' and 'he is one man that is' (it is plain that there is no distinction in [the processes] coming to be or destruction); and equally in the case of that which is one. It follows obviously that the addition indicates the same thing in these cases, and that which is one is nothing different apart from that which is".

Kirwan's notes should be consulted, especially since he comments on both the textual and philosophical problems in the passage. I have translated Gersonides' citation of this passage, which is taken from Averroes' *Middle Commentary on the Metaphysics*, as literally as is consistent with Aristotle's philosophical teachings. In the next paragraph Gersonides will provide a commentary on this passage, first citing the key phrases and then explaining them (See M. Steinschneider, *Hebraische Übersetzungen, 156-78 for a discussion of the history of the Arabic and Hebrew translations of Aristotle's Metaphysics*).

¹⁶This particular expression -- *adam hu* -- is difficult; literally, it means "he is a man". This difficulty is compounded by two facts: (1) there is no unanimity between the manuscripts and the printed editions, which have instead *adam nimtza*, "man exists". (2) The Greek original is also not unanimous and contains two pairs of expressions (a) $\epsilon\iota\varsigma \ \acute{\alpha}\nu + \ \acute{\nu}\rho\omega\pi\omicron\varsigma \ \kappa\alpha\iota \ +03B1\ \acute{\alpha}\nu\eta\upsilon\tau\omega\pi\omicron\varsigma$ (b) $\kappa\alpha\iota \ \acute{\omega}\nu \ \acute{\alpha}\nu\theta\omega\pi\omicron\varsigma \ \kappa\alpha\iota \ \acute{\alpha}\nu\theta\omega\pi\omicron\varsigma$ for the three Hebrew phrases '*adam' ehād*, '*adam hu* [*nimtza*' Leipzig], '*adam zeh*. The underlined Greek expression is omitted in several manuscripts. It should be noted that the reading of the printed editions corresponds then to the phrase $\acute{\omega}\nu \ \acute{\alpha}\nu\theta\omega\pi\omicron\varsigma$. This reading makes good sense of the whole argument; and so I render the phrase '*adam hu* as 'existent man', following Tredennick in his translation in the Loeb Classical Library edition of the *Metaphysics* (cf. Ross' notes in his edition of the *Metaphysics*). Later in his commentary on this passage Gersonides substitutes '*adam nimtza*' for '*adam hu*."

-176-

phrase 'existent man' and the phrase 'one man' neither in generation nor in corruption. ¹⁷ Similarly with respect to the term 'one': it is well-known that the addition of this term signifies the same thing; the term 'one' does not signify anything different from what the term 'exists' signifies. Moreover, we claim that the substance ¹ of each thing is one, and not accidentally: hence we say that the substance of each thing exists. It is well-known that the number of forms ^m of unity is the same as the number of forms of existence."

The following is how we have interpreted this passage in our commentary on the *Metaphysics*. ¹⁸

"Since ⁿ, however, unity and existence are one and the same thing" -- [i.e.,] for ^o that which exists is one and that which is one exists -; "or both of them have one and the same nature" -- for whatever nature exists it is one; hence, these two terms are predicated of one and the same subject ^p. It is clear, then, that however it is construed: "each one of them ^q follows the other as the beginning and the cause follow each other," -- since they both refer to the same thing, although they connote different aspects of it. It is clear that this feature [i.e., the coextensiveness] "does not result from their having the same definition", such that 'exists' and 'one' would be synonyms. For if this were the case, the expression 'the existent is one' would be equivalent to 'the existent exists.' However, these expressions signify one and the same essence in different ways. In general, 'one' signifies its lack of division, whereas 'exists' signifies its existence. Aristotle explains that even if we make this supposition with respect to 'exists' and 'one', i.e., they do not have the same definition -- which is in fact true -- nevertheless, there is no difference

between 'one' and 'exists'. Aristotle [explicitly] made this point, however, because many things follow each other [i.e., are coextensive] but they differ in their essences, e.g., 'laughing' and

¹⁷This last phrase will prove to be troublesome when we get to Gersonides' interpretation of it. The original Greek reads *δηλον δ' ὅτι οἱ χωρίζεται ἀενῆς ἐπὶ γένσεως ἐπὶ φθορᾶς* ("it is plain that there is no distinction in [the processes of] coming to be or destruction"). In most of the modern editions this phrase is enclosed in parentheses and construed as a parenthetical remark referring to the inseparability of the term $\acute{\alpha} + \hat{\zeta}$ and, $\acute{\omega}\nu$ in the process of generation and corruption. However, when Gersonides comes to interpret this phrase in the sequel he will give it a different construction.

A further difficulty lies in the order of the two terms under discussion. The Greek has: *το εἶ + ῆ ἄνθρωπος καὶ εἶ + ῆ ὧν ἄνθρωπος* ("he is one man' and 'he is one man that is' "). Gersonides has: *'adam hu o 'adam 'ehad lo behavayah v'lo behesed*. In his interpretation of this passage this inversion will be important.

¹⁸Gersonides' *Supercommentary on Averroes' Middle Commentary on Aristotle's Metaphysics* is not extant.

-177-

'rational.' For this reason, in the case of 'one' and 'exists' he tried to explain that the essence is one and the same. ¹⁹

This [Aristotle continues] can be explained in [the following] manner.

"The phrase 'one man', 'existent man', and 'this man' " -- (i.e., the man who is perceived and denoted by the word 'this') -- "all signify one and the same thing," since these predicates are not additions to the essence of man, as the [predicates are in such] expressions as 'a man writing' [or 'a man is writing'], 'a white man' [or 'a man is white']; for the latter signify things that are essentially different and [in addition] they signify accidentally one thing -- i.e., in so far as the man who is writing is [also] white. ²⁰ Now it is clear that these predicates i.e., 'one' and 'existent', do not signify different things, since ¹ we find that "they do not signify different things when they are duplicated" and we say 'this is one man ^s' or 'this ^t one man exists'. Indeed, this is so because each one of them signifies one and the same essence, although they connote different aspects of it. For when [genuinely] different predicates are duplicated [as predicates of one and the same subject], they necessarily signify different things [i.e., features of this subject]; e.g., when we say, "Reuben who is a white man is writing." For in this sentence one predicate signifies only the existence of the accident whiteness inhering in Reuben, whereas the other predicate signifies the existence [of the accident of] writing in him. But when these predicates are not duplicated, it would seem that both of them signify [separately] one and the same thing, e.g., Reuben; for when Reuben is described as white, this term ['white'] signifies at the same time whiteness and the subject, i.e., Reuben. Similarly, when he is described as writing. ²¹

¹⁹Gersonides' example here of laughter suggests that he is referring to Aristotle's notion of the *proprium* (Aristotle, *Topics*, 1: 5. Maimonides, *Treatise on Logic X*, where the example of laughter is given). A *proprium* [segulah] is a property that uniquely belongs to every member of a given species but does not constitute its essence; moreover, it is convertible with the predicate expression for that species. For example, 'rational' and 'capable of laughter' are convertible, i.e., coextensive; but the latter is not a defining feature of the human species. Nor are 'rational' and 'capable of laughter' synonymous. Concerning the terms 'one' and 'exists',

however, Gersonides maintains that they have the same essence; yet they differ in definition in so far as they connote different aspects of this essence.

²⁰The predicates 'writing' and 'white' differ essentially from each other, signifying different properties; but in the case before us they are "accidentally" true of one and the same man, Reuben.

The term *kotev* used here corresponds to the Greek *μουσικός*, which can be translated as 'musical', 'grammatical' or 'cultured'. The Hebrew proximates the latter two renditions (Aristotle, *On Interpretation*, XI, 20b, 31-21a 15; *Metaphysics*, VII: 6).

²¹In the case of 'white' and 'writing', these predicates when predicated *together* of the same subject signify *two different* properties of this *same subject*: 'Reuben is a white [man] who is writing'. But when these predicates are asserted separately of the same subject - 'Reuben is white' and 'Reuben is writing' -- it might appear that they signify one and the same thing, i.e., Reuben, and thus they would be like 'one' and 'existent'. But this is not really so; for, although these predicates are true of one and the same subject, they connote two different properties of this subject. The false impression derives from the fact that the predicate 'white', for example, signifies at the same time the subject, e.g., Reuben, and the property of whiteness. Similarly in the case of the predicate 'writing'. In both instances the predicates are different from each other as well as different from the subject of which they are both *as a matter of contingent fact* true. In the cases of 'one' and 'existent', however, not only are these predicates not essentially different from each other but they also do not signify features that are essentially different from any thing of which they predicated. For *every* man is both one and existent (Aristotle, *Physics*, 1: 2, [185 b 33 - 34](#)).

-178-

Accordingly, i.e., given the predicates ['one' and 'exists'] are such that when they are duplicated ^u they do not signify different things, it is evident that the phrases 'existent man' and 'one man' do not signify [separately] different things. For there is no difference between the phrase 'existent man' when it is not combined with the second predicate, i.e., 'one', and the phrase in which both these predicates are combined, 'one man, neither in generation nor in corruption', (i.e., exists) --, since that which proceeds towards generation does not exist as an actual man, nor does that which [proceeds towards] corruption. ²²Now, this [latter] expression [i.e., 'one man, neither in generation nor corruption'] is ^v like the phrase 'one man exists'^w. However, Aristotle did not want to give an example of this saying "one man exists" ['*adam ehad nimtza*'] since no one would utter such a statement, in so far as it is obvious that whatever is one exists. ²³[Yet], it is possible to construe Aristotle's statement "there is no difference between saying 'existent man' or ^x'one man, neither in generation nor in corruption' " [as meaning]: there is no difference between the phrases 'existent man' and 'one man, neither in the posses-

²²Here we see how Gersonides interprets this clause, which is parenthetical in the Greek, in a manner different from its original meaning. The original phrase is $\delta\eta + \lambda\omicron\nu\delta\delta\tau\iota\omicron\nu\chi\omega\rho\iota\lambda\lambda + 03B5\tau\alpha\iota\ H\upsilon\tau\ \acute{\epsilon}\pi\iota\ \lambda\epsilon\nu\rho\sigma\epsilon\omega\varsigma\ \acute{\omicron}\nu\tau\ \acute{\epsilon}\pi\iota\ \phi\theta\omicron\rho\alpha + \zeta$ which is interpreted by the recent commentators as signifying the inseparability of unity and existence in the processes of generation and corruption (See Ross', Tredennick's, and Apostle's commentaries on the *Metaphysics*). Gersonides, however, takes this clause to be part of one of the predicates under discussion, 'one'. Moreover, he interprets it as *excluding* the case where the individual is undergoing a process of generation or corruption; for in such situations the individual is not a complete man, and hence cannot be regarded as perfectly *one* or *existent*. In other words, the coextensiveness between 'exists' and 'one' is valid when the subject is a genuine and complete individual.

²³The phrases '*adam 'ehad nimtza*' ("one man exists") and '*adam nimtza*' ("man exists") are not only coextensive but, Gersonides claims, equivalent in meaning, in the sense that no one who uttered one would then go on to utter the other as an attempt to provide additional information. One dog is an existing dog and an existing dog is one dog.

In translating this passage I have been helped by Professor Charles Touati.

-179-

sion of a thing nor in the privation of that thing' ²⁴; the one does not signify anything besides what the other does. Nevertheless, the first explanation is more appropriate. Similarly with the term 'one': there is no difference between the phrases 'one man' and 'one man neither in generation nor in corruption', just as there is no difference between the phrases 'existent man' and 'one man neither in generation nor in corruption'. If this is so, it is, therefore, clear that the addition in duplicating these predicates [in these expressions] signifies one and the same thing. Accordingly, the term 'one' does not signify anything different from what is signified by the term 'exists'; for if it did, both of these predicates would necessarily signify different things when they are duplicated [in these expressions]. ²⁵

It can be demonstrated in another way that 'one' and 'exists' are not different [in nature]. The substance of each thing is one in a non-accidental way; i.e., it is not one by virtue of some accident inhering in it, as, for example, something is white because of the accident of whiteness in it. Rather, it is one by virtue of its essence, and the term 'one' does not signify the substance because of some feature in addition to its essence. This is evident, since if 'one' were predicated of all things by virtue of a supervenient accident existing in them, unity would be a genus of all things, just as quantity is the genus of all magnitudes. But this is impossible. For if unity were a genus, it would not be predicable of the [specific] differences by virtue of which the subordinate species are differentiated, since the genus cannot be predicated of the [specific] differences by virtue of which the species encompassed by the genus are differentiated. For example, 'animal' is not predicable of rationality or of flying, but it is predicable of individuals that are rational or that do fly. However, it is evident that the term 'one' is predicable of all the [specific] differences of existent things. ²⁶

Moreover, if each thing were one by virtue of an accident inhering in

²⁴*qinyan devar, he' der qinyan*. The term '*qinyan*' corresponds to Aristotle's category *ἔχειν, ἔστις* the possession or acquisition, of a condition or thing. Its opposite is the absence, or privation (*στέρησις*; *he' der*), of that condition or thing (Aristotle, *Categories*, 4, :1b 27, 10, :11b 18; *Metaphysics*, V: 20 and 22).

²⁵The upshot of this most difficult discussion seems to be this. The predicates 'one' and 'exists' are coextensive and have the same nature or essence, but express different aspects of this nature. These predicates differ from two other pairs of predicates: (a) 'laughing' and 'rational'; and (b) 'white' and 'writing'. In (a) the two predicates are coextensive but do not have the same nature, or essence. In (b) the two predicates not only do not have the same nature but also are not in general coextensive, although in a particular case they may be true of one and the same individual. In Gersonides' language they are true of this individual "accidentally."

²⁶Aristotle, *Metaphysics* X: 2; VII: 12; 111: 3, especially 998b 14-27; *Topics*, IV: 1.

-180-

it, it is evident that we would be able to refer to that thing apart from that accident when we call it by an underived term. ²⁷ But then that thing ^y is not describable as one, since it does not have [*ex hypothesi*] that accident which makes it one. But this is false, for each thing can be described as one.

Moreover, if each thing is one by virtue of some accident inherent in it, it would follow when we refer to this accident by means of an underived term that it would be describable as 'one' by another accident inherent in it ^z, and this ^{al} [procedure] can be extended *ad infinitum*, [which is absurd]. Accordingly, it is evident that the term 'one' does not denote an accidental property in addition to the essence of the thing of ^{b1} which it is predicated. For the same reason we say that the substance of each thing exists; i.e., the term 'exists'^{cl} does not [denote] an accidental property in addition to the essence [of the thing]. This is evident from the preceding discussion; for if the term 'exists' denotes things by virtue of an accidental property in addition to their essences, it would be a genus for all things. But this is impossible, since 'exists' is predicable of every one of the [specific] differences that differentiate those things that the term 'exists' encompasses. ²⁸ From this it is clear that Avicenna's doctrine concerning these predicates is definitely false. It is also evident from this that

²⁷*Shem bilti-nigzar*, "underived term". A derived term (*shem nigzar*) in medieval Hebrew and Arabic grammatical terminology is an adjective or participle; the underived term is the verb or verbal noun (Maimonides, *Treatise on Logic*, chap. 13; *Guide of the Perplexed*, I, chap. 61. I. Efros, *Philosophical Terms in the Moreh Nevukhim* (New York, 1924), 116-17. Averroes, *Tahāfut al-Tahāfut*, Seventh Discussion, page 224). The philosophical relevance of this grammatical distinction in the present context is this. A derived term is a composite term, since it connotes both the attribute from which the term was originally derived and the bearer, or subject, of this attribute. For example, the term "righteous" is a derived term that connotes both the property of doing righteous deeds and the person who does them. (This example, cited by Efros in his still important work on Maimonides' philosophical terminology, was given by Efodi, a medieval commentator of the *Guide*.) Clearly, such derived terms cannot be predicated of God, since they imply plurality, or compositeness, in that of which they are predicated. Such terms would make God a bearer of accidental properties; and this is to be shunned at all costs.

In Gersonides' present argument, the Avicennian hypothesis is entertained according to which the term 'one' connotes an adventitious accidental attribute such that it can be abstracted from each thing of which it is predicated. If this is so, Gersonides now argues, the thing to which the term 'one' applies can be referred to as such, e.g. 'dog' and not as 'one dog'. The term 'dog' is not a composite, a derived term, in this case, since it does not signify both an attribute and a subject. But, then, a dog would, in this hypothesis, not be one, since we have abstracted from it the accidental property of unity. But this is absurd (Touati, *La Pensée* 124, n. 83). All the more so in the case of God, the term 'one' does not signify such an adventitious accidental property, such that it would be abstracted from the subject, i.e., God, and leave the subject lacking the property *unity*.

²⁸Hence, despite the fact that the terms 'one' and 'exists' are universally predicable throughout the ten categories, they are neither universal genera nor universal accidents. The Scholastics call them "transcendental predicates." (Aristotle, *Metaphysics*, III: 3. Aquinas, *Summa Theologiae*, Part I, question II, article 1; De veritate, q. 1, a. 1. H. Reith, *The Metaphysics of St. Thomas Aquinas*, (Milwaukee, 1962), 120ff.

these attributes are appropriately predicable of God (may He be blessed), as the Torah in fact lays down.²⁹

The preceding discussion also shows that God is more properly describable as "active" than anything else. For He makes other things active in the way that a master-craft is related to the subordinate crafts: the former craft directs latter crafts in their activities in such a way that the goal intended by the former is achieved. This comes about through the desire of all the movers of the heavenly bodies to apprehend their respective parts of that law which is in the mind of the First Cause in so far as [this role] is part of that complete law, as we have explained previously. They are stimulated to move their spheres in this extraordinary manner by that very conception. Hence, the First [Cause] is continuously active in this sense upon all existent things. And since this activity deriving from [or ordered by] Him to these existents is [directed] towards their perfection and end, which is the good, it is proper to describe God as "beneficent", "gracious," and "munificent" more than any other existent. And since it is the form that it is the end (which is the good), and since God is the form of all existents, as has been explained -- for through Him the law of the universe is a unified system -- it is proper to describe God as "good" and "the end" more than anything else. For He gives the appropriate good and the end to everything, and the levels of goodness vary according to their levels of the law emanating to [for ordered for] them by the First Cause. Similarly, it is clear that God is more properly describable as "ever-lasting" and "permanent"; for it is He that endows everything else with their ever-lastingness and permanence. However, in God these properties are of His very essence. Similarly, He, more than

²⁹The conclusion of this difficult discussion is as follows. Avicenna had maintained that the terms 'one' and 'exists' are adventitious accidents that "come upon" their subjects from some external cause, except in the unique case of God, whose essence includes both unity and existence. Following Averroes, Gersonides rejects this doctrine. He claims instead that the terms 'exists' and 'one' are not adventitious accidents of *anything*: each existent thing is one and any one thing exists. To be sure, since God, *ex hypothesi*, exists and is one most eminently, or *per prius et posterius*, God endows everything else with existence and unity. But these latter features are not external properties that are received by the essence of a thing, as Avicenna claims, no less in a dog as in God. An existent dog can no more cease to be *one* dog than God can stop being one. Of course, this doesn't mean that God's unity is identical with Fido's unity. In God's case, the unity is such that there are no other divine entities; in Fido's case, this is clearly not so. For this reason it is better to call the divine unity "unicity".

anything else, is properly described as "righteous" and "upright", since righteousness and uprightness are acquired by creatures from Him. The same is true for the attributes of strength and power, which is of the utmost [degree]; for it is evident from what emanates from Him in this extraordinary manner that in God there is no weariness or impotence. In short, it is He who gives strength and power to other forms so that they can perform their marvelous activities; hence, it is obvious that God is more properly describable by these attributes than are other existents.

It is important to realize, [however], that all these predicates refer to *one* thing, even though they connote different aspects of Him. It is important that we make known^{d1} to the common people that when God is described by these properties^{e1}, He is described by them in an immeasurably more noble way than when other things are described by these terms. Similarly, it is necessary that we deny of Him any properties that are imperfections, which it might be thought belong to Him.

With respect to the relation between God and the separate movers, which has been discussed before, it is most remote, such that no relation [or comparison] exists between them. This can be [easily] seen if you suppose that all the objects of knowledge in the soul of the First Cause are present in each of these movers but do not suppose ^{f1} that they apprehend that by virtue of which all these objects of knowledge become one, i.e., that which is related to them as form. There would be no relation [or comparison] *at all* between God and these movers; for there is no comparison between the matter and the form. But if we suppose that these movers possess only *some* of these objects of knowledge, they are infinitely more removed from His level of perfection; all the more when it is posited that they apprehend only a small part of the law of the whole universe, as has been demonstrated to be true of these movers. For it has been shown that each one of them apprehends only that [part of] the plan which specifically [*beyihud*] emanates from it, but not that which emanates from any of the other movers, nor that which emanates from the mixture of the rays of the heavenly bodies. ³⁰ Thus, it has been demonstrated that there is no relation [or comparison] at all between God (may He be blessed) and the movers of the heavenly bodies; for the latter are quite imperfect in comparison with God's perfection. Therefore, it is said: "Behold, He putteth no trust in His servants, and His angels He chargeth with folly." ³¹ Finally, there is no comparison between that whose existence, permanence, and knowledge ^{g1} derive from its own essence and that whose existence, permanence, and knowledge derive from something else.

Now it should be realized that when it has been claimed that these

³⁰Supra, chap. 11.

³¹Job 4: 18.

-183-

movers are such that the knowledge of the law of the universe in one differs from the knowledge ^{h1} of the law of the universe in the others, there is no need to assert ⁱ¹ that all of them are causally related to each other in order to differentiate one from the other. For intellects that have the same knowledge are all numerically identical, since there is no plurality in things that have the same form except by virtue of matter. But since these intellects are incorporeal, it would be impossible for them to exhibit plurality when their status has been assumed to be such, [i.e., they have the same knowledge]. However, intellects in which there are different objects of knowledge, as is the case with these movers (as has been demonstrated), are necessarily numerically diverse.

-184-

CHAPTER XIII

IT is proper that we now discuss a very obscure and difficult problem: Is the agent that generates things in the sub-lunar world -- i.e., the Agent Intellect whose existence has been proven in *On the Soul*, as we have previously indicated ¹ -- one of the movers of the heavenly bodies; or is it something that emanates from all of them; or is it the First Cause itself, or something that emanates from the latter?

Now it seems that the Agent Intellect cannot be one of the movers of the heavenly bodies; for if this were so, it would not be able to have an apprehension of the *whole* law of the sub-lunar world, since each one of these movers has only a partial conception of this plan, as has been demonstrated. ² [But] from another point of view it does seem that the movers of the heavenly bodies must be the generators of sub-lunar phenomena. For they are responsible for the mixtures,

and it is appropriate that generation and formation derive from that which is responsible for the mixtures; for the whole [sub-lunar world] is one [act] of generation, and one generation should be derived from one agent. [Hence, the agent responsible for sub-lunar generation, or the Agent Intellect, should be one of the movers of the spheres.] Upon further examination, however, this [latter hypothesis] turns out to be untenable. It is possible [in general] for many things to make a mixture and for the mixture to be generated from different natures^a, which make the various mixtures. But formation and giving of form^b cannot derive from many things. This is evident.³

This generation could, however, be derived from one [agent] either if these movers of the heavenly bodies were [assumed] to emanate^c from the intellect that generates these phenomena and the heavenly bodies were [assumed] to function as instruments for this agent by being responsible for the mixture; or if this intellect were [assumed] to emanate from all^d these movers, just as their rays, which [in fact] are responsible for the mixture, emanate from all the heavenly bodies. It has also been

¹Aristotle, *On the Soul*, III: 5. Gersonides, *The Wars of the Lord*, Bk, 5, pt. 3, chap. 5

²Gersonides, *The Wars of the Lord*, Bk. 5, pt. 3, chaps. 9 and 11

³Thus, although the mixtures can be brought about by the different movers of the spheres, the endowment of form cannot. Hence, the Agent Intellect, which is responsible for the giving of form, is not one of the movers of the spheres.

thought that the Agent Intellect cannot emanate from the movers of the spheres; for if this were possible, the Agent Intellect could not have an apprehension of the law of the universe except in the sense of a synthesis of the conceptions of all the movers. But since this synthesis is itself only a partial picture of the whole law, for the movers do not apprehend the results of the mixtures, as has been explained, the Agent Intellect would have only an apprehension of part of this law. It has been shown in this book^e, however, that the Agent Intellect has a complete apprehension of this law. Thus, an inconsistency results.

It seems also that the Agent Intellect cannot be something that emanates [directly] from God (may He be blessed). For if this were the case, either of the following alternatives would follow: (1) the Agent Intellect and all the movers^f of the heavenly bodies would all emanate equally from God without any differences in priority; or (2) the Agent Intellect would emanate from God, whereas the movers of the heavenly bodies would emanate from the Agent Intellect. Now the [first] alternative -- that they all emanate from God without any differentiation -- is false. For, since the Agent Intellect has an apprehension of the law of the sub-lunar world in its entirety and knows in addition the influences coming from the heavenly bodies (as has been explained in Books I and II), whereas the movers^g of the heavenly bodies have only a partial apprehension of this law, it is clear that on this alternative [i.e., that the Agent Intellect and the movers of the spheres all emanate from God] the relation between the knowledge of the Agent Intellect and the knowledge of the movers would be comparable to the relationship between the mastercraft and the crafts subordinate to it.⁴ Moreover, it follows from this hypothesis that the preparation of the matter is attributable to one agent, whereas the giving of the form is assigned to another agent. But this is an awkward consequence. For, since the preparation of the matter is derived from whatever gives the form (because of this the preparation of the matter is directed in the most appropriate way for the attainment^h of the end, which is the form), it is necessary that the agent of both processes [i.e., the preparation of matter and the giving of form] be one and the same thing.⁵ It was this consideration that ledⁱ Aristotle to say that the giver of forms for these [sub-lunar] phenomena is soul emanating from the spheres.⁶

⁴But this kind of relationship is incompatible with the assertion that they all emanate *equally* from God.

⁵If one agent is responsible for both the preparation of the matter and the giving of the forms, then not all of the intellects emanating *equally* from God will be active. Actually, this means that they are not all equal in status, which is *contra hypothesem*.

⁶This is really the thesis of Themistius. Gersonides, *The Wars of the Lord*, Bk. 5, pt. 3, chap. 2. Gersonides, *Commentary on Proverbs*, 30: 4.

-186-

But if it is asserted that the Agent Intellect gives the movers of the spheres the laws by virtue of which the preparation of the matter is accomplished, whereas it itself gives the form (analogous to the case of a master-craft and the subordinate crafts), two difficulties arise. First, on this assumption the less superior [agent] would move^j a body that is superior to the body that is moved by a superior [agent]. For the Agent Intellect influences only the matter in the sub-lunar world, whereas the movers of the heavenly bodies, which [according to the second of the original alternatives] emanate from the Agent Intellect, influence the heavenly body, which is infinitely superior to sub-lunar matter.⁷ This difficulty implies also that the Agent Intellect, about which this inquiry is concerned, is not identical with God. Second, on this hypothesis our thesis that there is an intellect that is prior to the Agent Intellect would be gratuitous; for the Agent Intellect would be sufficient, according to the characterization given it by this hypothesis, to account for the perfection of all the sub-lunar world. Thus, the activity of the first [agent], which is the most noble, would be specifically associated with a body that is immeasurably inferior to the celestial body, which is moved by the intelligences that are derived [on this hypothesis] from it [the Agent Intellect]. This is utter nonsense.⁸

Now someone might object that God is the agent of everything, since the heavenly bodies serve only as His instruments in what they do; for their activities emanate from their knowledge of the greatness of God's perfection, as has been explained. And since the Agent Intellect is [on this hypothesis] God, it is not attached to the heavenly spheres nor to the sub-lunar world in an essential way; rather, its activity reaches whatever is prepared to receive it [and] according to the mode of receptivity. [Nevertheless], the previous [i.e., the first] difficulty still remains. For^k it would follow from this hypothesis that God's activity is specifically associated with the matter of the sub-lunar domain and that He operates therein without any principle, [or cause], other than the mixture by virtue of which the matter is prepared to receive His will. On the other hand, [it would follow that] He would have no activity upon the heavenly bodies except by means of a principle inherent in them from which this activity would be derived [or ordered].⁹ Moreover, if this hypothesis

⁷Aristotle, *On the Heavens*, I: 1- 4.

⁸On this second alternative, it would follow that the Agent Intellect assumes the role of God but is at the same time linked with earthly matter, which is inferior to the matter of the heavenly bodies. The Agent Intellect is linked with earthly matter since it is the agent of generation, and generation takes place in the sub-lunar world.

⁹The activity of God, or the Agent Intellect (on this hypothesis), on the sub-lunar matter involves only the mixtures, whereas His influence upon the matter of the heavenly spheres requires an instrument, i.e., the intelligences, or movers of the spheres, which *ex hypothesi* emanate from God, or the Agent Intellect.

-187-

is adopted, it would be difficult to explain why the first [agent] was eternally idle before its creation of the world and then eternally creative in the manner suggested. [Indeed], it shall be indubitably demonstrated later on [in this treatise] that the universe is created *absolutely* [i.e., at one moment]. ¹⁰

But if it is assumed that the Agent Intellect is an effect of the movers of the heavenly bodies, this difficulty does not arise. For God's unique activity is self-knowledge, and this activity is unceasing; whereas His creation of the world was an activity like that of a perfect agent who makes something with all the means possible for its survival. This is evident in the crafts that have attained a high level of perfection. It is even more evident in natural phenomena. For the creation of animals [shows that they have been created] in the best manner possible for their maximum survival in so far as they are endowed with [various] active and passive capacities. Accordingly, it is clear that it is fitting that god's creation of the universe be of this character, since He is the utmost in perfection; hence, His activity is the most perfect. God continually preserves the world in so far as He lovingly gives to the preserving causes of the world the [powers] to do what was ordered for them on the day when they were created. ¹¹ Nevertheless, if this is the case, the previous difficulty pertaining to the Agent Intellect still remains [i.e., does it derive *from* the movers of the spheres or vice versa?]. This is the obscurity, as it seems to us, that infects the doctrine of the Agent Intellect.

Now it seems [to us] that the Agent Intellect is something that emanates from the movers of the heavenly bodies, as has been explained previously. And just as there emanates from them by means of their rays that which they conceive of this law [of the sub-lunar world] and that which they do not conceive, i.e., what results from the mixing ¹ [of the rays], so there emanates from them by means of intellectual conception that which is conceived by them of the law of existent things and that which is not conceived by them of this law, -- i.e., that which emanates from the mixtures [of their rays]. ¹²

¹⁰Gersonides, *The Wars of Lord*, Bk. 6, pt. 1, chaps. 7-9.

¹¹Although God's creative act is a "one-time" event, He has endowed His creatures with all the equipment they will need for their survival. Thus, creation is unique; preservation, however, is continuous in so far as it has been built into nature from the very beginning.

¹²Even though the Agent Intellect emanates from all the movers of the spheres, its rank is superior to them because its knowledge of the sub-lunar world is more comprehensive and direct. The movers of the heavenly bodies, it will be remembered, know only that which emanates from them *individually*; moreover, their influence is via their radiation; finally, they do not apprehend the results of the mixing of their rays.

Perhaps someone might object: how is it possible for something to emanate from another thing if it is not possessed ^m [or conceived] by the latter at all? This objection can be solved as follows. If there were no intellect [at all] having this apprehension, this objection would be pertinent. But since there is an intellect having a comprehensive conception [of the law of the sub-lunar domain], i.e., God, it is not impossible that there emanate from Him via the movers ⁿ of the heavenly bodies a conception that they [i.e., the movers] do not possess, just as there emanates from Him via the heavenly bodies that which is not conceived by any one ^o of these movers. ¹³ Moreover, just as complete health accrues to an ill man from imperfect health, as Aristotle points out, ¹⁴ so is it possible that from defective knowledge a more perfect knowledge emanate. Furthermore, since from the movers emanate the conceptions that they have, and [since] from the synthesis of those distinct conceptions there results some apprehension of what emanates from

the mixing [of the rays], the intellect that emanates from these movers [i.e., the Agent Intellect] apprehends that which emanates from the mixing [of the rays], since it possesses a synthesis ^p of all those conceptions [of the movers]. In this way we have resolved this difficulty as best as we can. And it has been [also] demonstrated that the Agent Intellect is the conception emanating from *all* the movers of the heavenly bodies. And in this manner this sublunar world emanates from these movers. For they prepare the matter via the rays of their heavenly bodies and they give the form by means of the intellect emanating ^q from them.

Now forms ^r exhibit various levels. For there is a form that has no particular relationship with any [particular] part of the universe, [i.e., God]. And from this form there emanate directly [other] forms that do have some attachment to the noblest parts of the universe; they are movers of the heavenly bodies. By means of the latter there emanates a form [i.e., the Agent Intellect] that has a certain attachment to the sub-lunar matter; and by means of this [latter] form the material forms emanate according to their various levels. This account of the Agent Intellect was advanced by the earlier philosophers who are worthy of study; they maintained that the Agent Intellect is inferior in rank to the movers of the spheres. ¹⁵

¹³The conception of the *whole* plan of the sub-lunar domain is not possessed by any one of the separate movers of the spheres. This plan, however, emanates from God through them to the Agent Intellect, just as there emanates from Him through the bodies of the spheres an aspect of this plan that these movers do not apprehend, i.e., the results of the mixtures of their illuminations. In other words, just because the separate movers are the vehicles or intermediaries for the emanation of the Agent Intellect, it is not the case that they have the same knowledge that is possessed by it.

¹⁴Aristotle, *Metaphysics*, VII: 7, 1032b 4 - 14.

¹⁵Maimonides, *Guide*, II: 11.

This is also the view of our Torah, as it would appear from the existence of the Cherubim, as we ^s shall explain in our *Commentary on the Torah*. ¹⁶ This is also the view of many of the Rabbis (of blessed memory), as can be seen from their remarks throughout the Talmud. ¹⁷

But this doctrine gives rise to a serious difficulty that we must attempt to remove. When it is claimed that the Agent Intellect has a conception of the law of the sub-lunar world in its entirety, it would seem that the Agent Intellect and God (may He be blessed) are numerically identical, and the very same difficulty previously discussed would ensue. This difficulty can be met if it is maintained that the Agent Intellect has perfect knowledge of the law and rightness of the sub-lunar world as it derives from the heavenly spheres, but it does not have perfect knowledge of the plan governing the heavenly bodies and how from this latter plan the plan of the sub-lunar world is derived, except imperfectly, i.e., in the sense that an effect knows its cause. Whereas the First Intellect ^t (He be blessed), has the most perfect knowledge possible of the whole law ^u verse, of the celestial as well as of the terrestrial domains. Accordingly, it is clear that there is no comparison between God (may He be blessed) and the Agent Intellect. Since the Agent Intellect has in common with God a conception of the sub-lunar domain in its entirety, our Sages of blessed memory said of it, "its name is the name of its master." ¹⁸

Elisha [*ben Abuyah*], or ^v "Aher", made the same mistake in thinking that the deity who governs the sub-lunar world is different from the deity governing the celestial world. ¹⁹ His error was the following: he thought that the principle, [or cause], [governing] corruptible things is different from the principle [governing] incorruptible phenomena. This is one of the questions discussed

by Aristotle in the *Metaphysics*. After considering this matter [Elisha] concluded that the principle governing

¹⁶Gersonides, *Commentary on Exodus*, [104 b](#).

¹⁷Gersonides is referring to *B. T. Sanhedrin*, [38 b](#), and *B. T. Haggigah*, [12 b](#), which he discusses a few paragraphs later.

¹⁸*B. T. Sanhedrin*, [38 b](#). The full passage is:



This quotation is a fragment from a set of exchanges between various Talmudic sages and certain heretics or pagans about angelology. In this passage an analogy is made between one angel, Metatron, and God, by virtue of the equivalence in numerical values between the names



(S. Feldman, "Platonic Themes in Gersonides' Doctrine of the Agent Intellect" in: Neoplatonism and Jewish Thought, edited by Lenn E. Goodman. International Society for Neoplatonic Studies: SUNY, 1992), 255-77).

¹⁹Elisha ben Abuyah, or "Aher", was a famous Rabbi of the Mishnah, who advanced certain heterodox views about divine providence. He is regarded in subsequent Jewish literature as the prototype of the doubter of divine goodness or mercy.

-190-

corruptible phenomena must itself be corruptible. This led him ^w think there is no immortality of the human soul at all, since, according to him, corruptible things lack something through which permanence would be possible; for their principle is corruptible. The nature of this mistake is explained in the *Metaphysics*. [20](#)

It seems that the Agent Intellect is the *aravot* [21](#) according to some of our ancient sages. Accordingly ^x, they said of it that the souls of the righteous and the souls and spirits of future creatures reside there. The Prophets ^y called it "*aravot*" because the emanations from all the movers of the spheres are mixed there. [22](#) It is possible that *aravot* refers to the spheres of the fixed stars, and that the latter was called "*aravot*" because many influences are mixed there by virtue of the many stars in that sphere and because it is responsible to some extent for the influences of the other heavenly bodies. This too was the view of our ancient sages (of blessed memory), according to what is said in the chapter [titled] "Do not seek." [23](#) It is also possible to construe the term "*aravot*" as referring to the spheres altogether ^z, since sub-lunar phenomena are perfected by the mixture from their emanations. Thus, God is described as "Riding on the *aravot*"; [24](#) for He governs all the spheres and is responsible for their activities, as has been explained.

We have now accomplished what we set out to do in this chapter: we have proven the existence of two separate intellects besides the movers of the spheres, i.e., God (may He be blessed) and the Agent Intellect. Since the number of movers of the spheres is forty-eight, as has been mentioned previously, on the original assumption that no spheres have to be added because of latitudinal motion, [25](#) there are then fifty separate intellects. This seems to be the view of the Torah. Thus, God (may He be blessed) commanded [us] to sanctify the fiftieth year as a Jubilee Year and the fiftieth day as the holiday [of Shavuot] in order to teach [us] that there is a Cause superior ^{b1} to all these forty-nine intellects. Indeed, the tithe [26](#) too [was instituted] for this purpose. For the movers of the spheres containing bodies -- and they are the chief movers

amongst the spheres, since the others are the effects of them -- are eight in number; the Agent Intellect is the ninth, and God (may He be blessed) in the tenth, Who is holy.

²⁰Aristotle, *Metaphysics*, III: 4, 1000a 5-1001a 1; XI: 2.

²¹The seventh heaven.

²²The root *arb* can mean "mix".

²³*B. T. Haggigah*, 12.

²⁴Psalms 68: 5.

²⁵Gersonides, *The Wars of the Lord*, Bk. 5, pt. 3, chap. 6. Cf. Gersonides, *Commentary on the Pentateuch*, 105 c.

²⁶*Ha-màaser*, deriving from the root *eser*, "ten".

-191-

CHAPTER XIV

IT is important to realize the rank of this particular Book with respect to the other sciences; for we have found that its rank is much greater, so that it is actually the very acme¹ and goal of all the sciences. There are three [main divisions] of knowledge: (1) mathematics; (2) natural sciences; and (3) theology, [or metaphysics], as Aristotle has pointed out in many places.² Now part of this Book is the acme and goal of the mathematical sciences; for the ultimate goal of mathematics is obviously the knowledge of astronomy. And since our investigation [of this science] in that part has been completed to the extent that it is possible, including the true astronomical model and precise measurements (either^a actually or nearly so), as is evident from our discussions, it is therefore the acme and goal of mathematics, as far as this can be achieved.

The second part of this Book is the acme and goal of the natural sciences. Since the heavenly domain is the form and perfection of all other natural phenomena, the knowledge of the former domain is the form and perfection of the knowledge^b of the other natural phenomena. For one thing is related to another thing as the intelligible form of one is related to the intelligible form of the other. And since in this [second] part [of Book 5] we have attained, as far as it is possible, perfect knowledge of the causes of the various properties of the heavenly bodies, it is therefore the acme and goal of the natural sciences, as far as that is attainable.

The third part of this Book is the acme and goal of the most comprehensive science. The science of theology, [or metaphysics], concerns many questions that require investigation, as Aristotle has pointed out.³ What functions as the goal and form in these subjects is the knowledge of God and the movers of the heavenly bodies, as far as this is attainable by us. This is obvious. Since we have in part [three of this Book] achieved what can be attained on these topics, this part is the acme and goal of theology, [of metaphysics], as far as it is attainable by us. We have therefore seen fit to end this fifth Book [of our treatise]. Blessed be the Lord Who has helped us in His mercy and plentiful kindness.

(This book was completed on the second day of Tevet, 5089 [i.e., December 5, 1328]).

¹Literally, "fruit".

²Aristotle, *Metaphysics*, VI: 1.

³Aristotle, op. cit., IV: 1-2.

-192-

SYNOPSIS OF BOOK VI

Part 1 -- Creation of the Universe

WHEREAS Book 5 is concerned with various astronomical and general cosmological issues that range over the whole extent of the universe, Book 6 discusses the venerable and perennial question of the origin of the universe. From cosmology we move on to cosmogony. Yet, although Book 6 is the final part of the whole treatise, it was the first to be written. It would appear that it was Gersonides' original intention to write a monograph devoted solely to the issue of creation. But after having written a preliminary draft, he realized that it would be better understood if it were placed within a more comprehensive context, since several of the points in his theory of creation presuppose principles from other topics in philosophy. Hence, the scope of the original undertaking had to be enlarged, and thus *The Wars of the Lord* as we now have it came into being. ¹

The reason for Gersonides' desire to take up this question relatively early in his philosophical career is not difficult to fathom. The problem of creation was not only one of the more hotly debated issues in medieval philosophy but it was one that his illustrious predecessor Maimonides had left hanging in mid-air; or at least this is how it appeared to Gersonides. Although Maimonides devoted considerable attention to this issue in his *Guide*, one of his conclusions was bound to cause some dissatisfaction to his readers. Maimonides concluded that neither the eternity of the universe nor creation of the world is a *provable* hypothesis, and hence in this matter acceptance of religious tradition is appropriate, indeed obligatory. ² At this point it will be important for us to pause and take note at what Maimonides and Gersonides mean by "proof". Both accept the Aristotelian notion of scientific demonstration: a hypothesis is scientifically proved when it is shown to be necessarily true, i.e., it is derived from necessarily true premises. ³ With this strong notion of proof Maimonides argued that no such proof is available for either hypothesis; moreover, he claimed Aristotle himself admitted as

¹Gersonides, *The Wars of the Lord*, vol. 1, 55-58, 91, n.1.

²Maimonides, *Guide*, II:15-16, 23, 25.

³Aristotle, *Posterior Analytics*, I:2. Maimonides, op. cit., I:31, 33, II:16. Gersonides, *The Wars of the Lord*, vol. 1, 92, n.2.

much. ⁴ Although Maimonides went on to show that a less than demonstrative argument is available in behalf of the creation hypothesis, he explicitly states that such an argument is just that: it does not *prove* creation; it only advances considerations that make the creation hypothesis more *plausible* than the eternity hypothesis. ⁵ Absolute certainty on this matter eludes human reason and belief in prophetic tradition is the only way to remove all doubts on this score. ⁶ This conclusion was unacceptable to Gersonides who, here as well as elsewhere, wanted philosophical proof, not just a plausible argument. And so he undertook to re-examine the whole issue anew and to provide what he believed Maimonides failed to furnish -- a scientific demonstration of the truth of creation of the universe. ⁷

But before we discuss this demonstration it will be useful to follow Gersonides' own procedure and to survey the various competing hypotheses. In the medieval debate on creation there were several different theories in contention. Aristotle had claimed that the universe had no beginning at all nor will it have an end; the universe is eternal. ⁸ On the other hand, the first sentence of Scripture states that the universe was created by God. To most readers this means at least that the universe had a temporal origin: both the universe and time had an absolute beginning. But the

notion of creation itself is vague. After all, even if we were to accept Scripture, how are we to construe the creative act? The religious traditions in Judaism, Christianity, and Islam all interpreted creation as creation *ex nihilo*: God created the world out of no pre-existent material substance. ⁹ The doctrine of creation *ex nihilo* is the contrary of a fairly

⁴Maimonides, op.cit., II:15.

⁵Ibid., II:21-22, 24.

⁶On this score Maimonides' view approximates the doctrine of Kant, who in his *Critique of Pure Reason* argues that the question of the universe's beginning is an "antimony of pure reason" (*Critique of Pure Reason*, B 454-57).

⁷Ever since the Middle Ages there has been an "esoteric" reading of *The Guide* according to which Maimonides' real doctrine is not creation *ex nihilo* -- the "exoteric teaching" -- but some form of the eternity theory. This was the interpretation of his medieval commentators Joseph ibn Kaspi and Moses Narboni; indeed, it was the interpretation of his translator Samuel ibn Tibbon. In recent years this reading of *The Guide* has been advocated by Leo Strauss and Shlomo Pines, the most recent translator of *The Guide* into English. However, Gersonides read Maimonides literally, i.e., he understood Maimonides as having advocated the "exoteric reading", the creation of the universe *ex nihilo* at the first instant of time.

⁸Aristotle, *Physics*, VIII:1; *On the Heavens*, I:12.

⁹According to Wolfson, the first literary source for this idea is in 2 Maccabees 7:28. Wolfson, *Philo*, (Cambridge, Mass., 1948) vol. I, 303. In Rabbinic literature we find this view expressed in *Bereshit Rabbah*, I:9. For more recent discussions of this topic see Jonathan Goldstein, "The Origins of the Doctrine of Creation Ex Nihilo", *Journal of Jewish Studies* 35 (1984), 127-35. David Winston, *Philo of Alexandria: The Contemplative Life, the Giants, and Selections*, (New York, 1981), Introduction.

common general view of creation found in ancient philosophy according to which the present universe has been produced out of some pre-existent matter or from a previous world. The most famous and philosophically respectable version of such a general view was the doctrine attributed to Plato by Aristotle and the medievals that the universe was fashioned out of some primordial formless matter by a divine craftsman. ¹⁰ This theory found its way into Hellenistic-Jewish thought and appears, for example, in the *Wisdom of Solomon* 2:17. ¹¹ In the medieval Jewish philosophical tradition it was vigorously rejected by Saadia ¹², tolerated by Hallevi ¹³ and ostensibly rejected by Maimonides, who believed that despite its falsity it was compatible with the Scriptural belief in miracles, which for Maimonides is the principle which underlies the whole debate and must be preserved by a believer in a revealed religion. ¹⁴ Finally, there was a third interpretation of the creation theory: the universe *eternally emanates* from God, who is its ultimate producing and sustaining cause. This view derives from Plotinus and was advocated by his school, especially Proclus, who read Plato's *Timaeus* in this light. It was advocated by the Muslim philosophers Al-Farabi and Avicenna. ¹⁵

With this diversity, indeed superabundance of cosmological theories, it is no wonder that Gersonides felt that a new inquiry into the matter was justified. With due respect to his predecessors, Gersonides defends his own entry into the fray by a version of the old Aristotelian formula "I love Plato, but I love the truth more." ¹⁶ He first gives an exhaustive critical exposition of the arguments for these hypotheses, and then offers his own theory of creation. The development of his own theory takes

¹⁰Plato, *Timaeus*, 48e-53c. Aristotle, *Physics*, 209b10. Maimonides, *Guide*, II:13, the second view. There is a question whether this doctrine is really the view of Plato; but this matter can be waived for our purpose.

¹¹Whether Philo maintained this "Platonic" view has been a subject of scholarly controversy. Julius Guttmann asserts that Philo followed Plato, whereas Wolfson denies this common interpretation and claims that Philo believed in creation *ex nihilo* (J. Guttmann, *Philosophies of Judaism*, (New York, 1973), 27. Wolfson, op.cit., 305 ff). More recently, David Winston has defended a different view: Philo believed in eternal creation ["Philo's Theory of Cosmogony", in: *Religious Syncretism in Antiquity* ed., B. Pearson (Missoula, 1975), 151-71]. Richard Sorabji, *Time, Creation, and the Continuum*, (Ithaca, 1983), 203-09.

¹²Saadia Gaon, *Book of Beliefs and Opinions*, Book I, chapter 2.

¹³Jehuda Hallevi, *The Kuzari*, I:67.

¹⁴Maimonides, op.cit., II:25. Herbert Davidson suggests that Platonic creation may have been Maimonides' esoteric view [H. Davidson, "Maimonides Secret Position on Creation", *Studies in Medieval Jewish History and Culture*, ed., I. Twersky(Harvard University Press: Cambridge, MA. 1979), 16-40].

¹⁵Plotinus, *Enneads*, 5.1.2. Proclus, *The Elements of Theology*, Propositions 1-23. Emil Fackenheim, "The Possibility of the Universe in Al-Farabi, Ibn Sina, and Maimonides", *Proceedings of the American Academy for Jewish Research*, 16 (1946-47), 39-70.

¹⁶Gersonides, Introduction, *The Wars of the Lord*, vol. 1, 91-97.

-195-

place according to four distinct stages: (1) a set of *proofs* for the hypothesis of creation; (2) a set of proofs for a modified version of the "Platonic" theory of a creation out of primordial matter; (3) a proof for the indestructibility of the universe; and (4) detailed criticisms of all of Aristotle's arguments against creation and for the eternity of the universe. The reader should not be surprised to find that it takes Gersonides twenty-nine chapters to accomplish these four goals. We shall, however, have mercy upon the reader and concentrate upon only the key themes of each of these stages of his overall argument.

One of the more pervasive principles of Gersonides' general philosophical orientation, as well as one of the main themes of Book 5, provides us with a handle for grasping the heart of Gersonides'; proofs for the creation of the universe. We have seen that he was a thorough-going teleologist: he saw natural events and processes, as well as the domain of human affairs, as exhibiting purposes and goals. In Book 5, part 3, he maintained that teleological considerations are the best signs for the existence of incorporeal agents, especially God. Now in Book 6 this same general point is applied to the specific issue of creation, and he will argue that such teleological signs constitute a decisive proof for the creation of the universe. This teleological orientation is clearly expressed in two of the three axioms Gersonides lays down as his guiding principles for this discussion. He postulates that if some object or phenomenon exhibits any one of the following three conditions, it is thereby a created thing: (1) a goal-directed internal structure; (2) non-essential properties: a non-essential property is a property that the thing need not have in order to be what it is; and (3) goal-directed behavior with respect to other phenomena. It is evident that conditions 1 and 3 are teleological; indeed, even condition 2 will turn out to have, as we shall see, a teleological consequence or connotation. Now if a substance, say a bee, exhibits such conditions, it is created, Gersonides maintains, because one cannot say that a substance that is teleologically structured could be so by chance. That bees as a species consistently and regularly perform a dance when they discover honey in a flower such that other bees are thereby attracted to that flower cannot be attributed to chance. This pattern of behavior is indeed part of their biological make-up; it is natural to them in the sense that they exhibit this behavior *for a purpose*. As Aristotle pointed out, what is regular and common cannot be

accidental. ¹⁷Indeed, Aristotle's whole orientation in biology and science in general was teleological, and Gersonides was quite right, as well as shrewd, in using Aristotle's own natural teleology against him. For if a phenome-

¹⁷Aristotle, *Physics*, II:8, 198b17-199a8.

-196-

non consistently exhibits a pattern of behavior that is goal-directed, and thus according to Aristotle himself cannot be explained by chance, it must be accounted for by attributing it to an agent who generated this phenomenon according to or for a purpose. It is, to use Gersonides' phrase, an "act of an agent". ¹⁸Aristotle himself suggested that nature is like a work of art in so far as it exhibits not only order but design as well. Well, Gersonides asks, why not carry out this analogy to its logical conclusion? Just as a work of art is created by an artist, so is the universe!

Let us now apply this general argument to a concrete case that Gersonides himself uses as an argument against Aristotle. He directs his argument right at the jugular vein of Aristotle's cosmology. The paradigm case of eternal motion, and hence eternity of the universe in general, is in the heavenly domain. Indeed, Aristotle argues to the eternity of the world from the eternal movements of the heavenly bodies. ¹⁹Gersonides' strategy consists in showing that the heavenly bodies satisfy *all* three of the above-mentioned conditions, and hence are created. And if the heavens are created, surely the rest of the universe must also be created. ²⁰

To simplify his argument we shall take one specific example, the sun. Gersonides had already argued in Book 5 that the behavior of the heavenly bodies is goal-directed and that in particular the movements of the heavenly spheres are so designed that the terrestrial domain receives the maximum benefit. The sun in particular, Aristotle had maintained, is responsible for the whole earthly cycle of generation and decay: it provides the necessary heat and light for the development of the appropriate nutrients for organic phenomena. ²¹As we have already seen, this beneficial behavior of the sun cannot be, as Aristotle himself admitted, fortuitous. It must then, Gersonides concludes, be the result of the design of a creator, or an agent who acts according to a purpose.

But besides exhibiting this teleological condition the sun also satisfies condition 2: it exhibits non-essential properties. Aristotle himself claimed that all the heavenly bodies have the same nature, or substance, the quintessence, or aether. ²²It can easily be seen, however, that this admission is virtually fatal for Aristotle's theory. For if they all have the same nature, why do they exhibit obvious differences in size, color, illumination, etc? The sun, for example, emits light, but the moon does not; the sun has spots, but the moon has craters. None of these features can

¹⁸Gersonides, *The Wars of the Lord*, Bk.6, Part 1, chapters 7 and 8.

¹⁹Aristotle, *Physics*, VIII:1.

²⁰Gersonides, *The Wars of the Lord*, Bk. 6, pt. 1, chap. 5.

²¹Aristotle, *On Generation and Corruption*, II:10-11.

²²Aristotle, *On the Heavens*, I:2-3.

-197-

be regarded as *essential* properties of the heavenly bodies as such, since they are not general properties of all such bodies. Nor can they be attributed to chance, since Aristotle himself claims chance phenomena do not exist in the heavenly domain.²³ That these properties are found in the heavenly bodies can only be accounted for if we admit that these bodies have been created in this way by an agent.²⁴ Thus, the heavenly bodies in general have been shown to exhibit all those conditions that prove them to be created by an agent.

These arguments clearly have force only within the Aristotelian medieval metaphysical and scientific context. In the modern scientific approach that excludes teleological thinking altogether and rejects the Aristotelian distinction between essential and non-essential properties, these arguments appear to be obsolete. Nevertheless, implicit in them is a logical point that is still of some interest and importance. The nerve of these arguments is the contention that Aristotelian physics alone does not adequately account for certain natural facts. Despite Aristotle's own efforts to explain such phenomena, they remain inexplicable within the limits of Aristotle's own system.²⁵ This failure indicates to Gersonides a structural flaw in Aristotle's whole cosmology and implies that we should look to another theory that offers a solution to these recalcitrant phenomena. In this respect the medieval creationists were making a methodological point of some merit: when a hypothesis fails to explain certain phenomena, we should see if another hypothesis does. If this is so, then the latter hypothesis is to be accepted so long as it is compatible with all the available empirical evidence. Gersonides believed that Aristotle's cosmology failed to explain certain features found in the heavenly domain; hence, the door was open to introduce another hypothesis, the creation theory, and to see whether the latter did account for these phenomena. To him it did; thus the creation hypothesis is to be accepted.

²³Aristotle, *Physics*, II:4. 196a 25-196b 4.

²⁴Gersonides, *The Wars of the Lord*, Bk. 6, pt. 1, chap. 8. This argument is a special case of a more general argument found in many medieval texts dealing with creation. It was known in the Arabic-Hebrew philosophical literature as the "principle of determination". Maimonides, *Guide*, I:74, II:19. S. Feldman, "Gersonides, Proofs for Creation of the Universe", *Proceedings of the American Academy for Jewish Research*, 35 (1967), 114-19. Herbert Davidson, *Proofs for Eternity, Creation, and the Existence of God in Medieval Islamic and Jewish Philosophy*, (Oxford, 1987), chap. 6.

²⁵Gersonides discusses Aristotle's attempts to explain these phenomena and finds his explanations inadequate. Gersonides, *The Wars of the Lord*, Bk. 6 pt. 1, chap. 9. Maimonides too, used this argument in favor of creation. Yet he did not believe that it *proved* creation (Maimonides, *Guide*, II:19 and 24). It is not altogether clear, however, why he did not. Perhaps it was too much of a Kalam argument, and his attitude toward Kalam was far more negative than was Gersonides'.

However, more chapters in Book 6 are devoted by Gersonides to a different kind of argument for creation. Whereas the teleological proof is direct and positive in form -- Gersonides lays down certain premises from which he then derives the conclusion that the universe must have been created by an agent having a purpose -- this second type of argument is an indirect, *reducto ad absurdum*, argument, showing that Aristotle's eternity hypothesis leads to certain logical absurdities. Moreover, throughout the various applications of this argument Gersonides focuses on one particular feature of Aristotle's hypothesis, the notion of the *infinite*. For the hypothesis of the eternity of the world is equivalent to the thesis that the universe is of infinite duration, infinite both in the past -- *a parte ante* -- as well as in the future -- *a parte post*. Gersonides' strategy at this stage of his discussion is to exploit an ambiguity in Aristotle's concept of the

infinite and to show that this concept leads to results that Aristotle would certainly not have welcomed.

The culprit here is Aristotle's notion of the actual infinite. Aristotle denied that any kind of actual infinite was possible. An actual infinite would be a magnitude all of whose infinite parts coexist. An example of such a magnitude would be a universe that is infinite in size or a universe containing an infinite number of individuals. Aristotle rejects all such possibilities.²⁶ On the other hand, he does allow for an infinite that is potentially infinite: its infinite parts or members exist successively, not simultaneously. For example, although every piece of matter is finite in size, it is *infinitely divisible*. Now, a universe whose duration is infinite is another kind of potential infinite, for time or duration is a magnitude whose parts are successive, not coexisting. Hence, although the universe is finite in size, it is infinite in duration. This means on a more mundane level that for Aristotle there has been an infinite series of human beings generating other human beings -- the species is eternal; whereas for the Bible there is Adam.²⁷

In chapters 7-15 of Book 6, Gersonides argues in exhaustive detail that Aristotle's distinction between the actual and the potential infinite breaks down in the case of time and motion, which is the crucial case for the concept of an eternal universe. In particular, Gersonides' thesis is that the notion of infinite duration runs counter to some of our commonsense intuitions about time and doesn't sit well with one of the standard rules about the infinite that was commonplace in ancient and medieval thought: no infinite can be greater than another infinite.²⁸ To illustrate

²⁶Aristotle, *Physics*, III:4-5.

²⁷Ibid., III:6-8. Maimonides, *Guide*, II, Introduction Principles 1 and 2.

²⁸H. Wolfson, *The Philosophy of Kalam*, (Cambridge, MA., 1976), 410-34. S. Feldman "Gersonides' Proofs for Creation of the Universe", *Proceedings of the American Academy for Jewish Research*, 35 (1967), 125-37. H. Davidson, *Proofs for Eternity, Creation, and the existence of God in Medieval Islamic and Jewish Philosophy*, chap. 4.

how Gersonides proves these two points I shall take one of his own examples for each of these points.

Let us assume that time is infinite in the past. Take any given day, May 21, 1976. If time is infinite a *parte ante*, then there were prior to May 21, 1976 an infinite number of days. Now consider a date before May 21, 1976, say April 21, 1976. Since time is infinite a *parte ante*, the number of days prior to April 21, 1976 is also infinite. But this means that the "month" that has elapsed between April 21 and May 21 hasn't made any difference at all to the age of the world; for the world is infinitely old at either point in time!²⁹

To illustrate the second difficulty, we have to explain a certain feature in medieval astronomy. The determination of the velocity of a planet relative to another planet involves the computation of the number of rotations each planet makes around the earth in a given period of time. The greater number of rotations means greater velocity. But if past time is infinite, the number of rotations that each and every planet has made during infinite past time is *infinite*; hence their velocities should all be the same. But they are not all the same! The observed differences in their velocities require that the number of rotations be different; but on the hypothesis of infinite past time, they are all equally infinite. And our previously mentioned principle states that one infinite is no greater than another infinite. Accordingly, Aristotle's theory is false and past time is finite;

therefore the universe had a temporal beginning. Aristotle has therefore been proven wrong within the framework of his own physics.³⁰

After having developed several different versions of this general argument, Gersonides then moves on to the next stage of his overall argument: *how* was the universe created? We have noted earlier that there were two main answers to this question in medieval cosmology: the traditional religious doctrine of creation *ex nihilo* and the Platonic philosophical theory of creation out of primordial matter (Gersonides gives only brief consideration to the eternal emanation theory).

²⁹Versions of this kind of argument were common in medieval philosophy (Wolfson, op.cit.). Not all medieval philosophers, however, accepted it: Aquinas and Crescas rejected this general kind of argument (Thomas Aquinas, *Summa Contra Gentiles*, II:38.). Hasdai Crescas, *Or Adonai*, III:1-4.

³⁰Gersonides, *The Wars of the Lord*, Bk. 6, chap. 11. Wolfson, op.cit., 414-15. Davidson, 89, 119. It is of interest to note that this principle concerning the incommensurability of the infinite was especially vexing to seventeenth century philosophers and scientists who were beginning to chafe under it. Galileo, Descartes, and Spinoza all felt its burden. But it was not until the mathematician Georg Cantor in the late nineteenth century that different orders of infinities were recognized.

-200-

Although the former has become by Gersonides' time the accepted, indeed almost dogmatic, view, Gersonides himself rejected this theory and argued vigorously in behalf of the Platonic hypothesis. This defense of Plato made Gersonides virtually unique in this matter, since almost all medieval Jewish philosophers opted for the creation *ex nihilo* theory.³¹ But Gersonides wasn't overwhelmed by the weight and authority of tradition or the reputation of some of his predecessors, as we have already learned. Notwithstanding the prestige of Maimonides he presents a strong attack against the traditional creation *ex nihilo* doctrine and a forthright defense of the Platonic theory. Indeed, whereas Yehudah Halevi confined himself to a cautious, conciliatory judgment that either hypothesis was acceptable from a religious point of view, and Maimonides suggested that although creation *ex nihilo* was the preferred doctrine from the point of view of tradition, the Platonic theory would be compatible with Scripture, Gersonides claims that the creation *ex nihilo* doctrine is absolutely false, indeed absurd.

Its absurdity can be seen on two levels. Firstly, do we ever see something made from nothing? Here Gersonides' empiricism, which was so prominent in his astronomy, is quite evident. On the basis of our own experience we would form the judgment that things are made from other things. Creation *ex nihilo* departs from our normal experience. But, it could be argued, creation is a miracle, and miracles are not ordinary! Moreover, as Saadia had pointed out, who ever claimed that creation is an event that anyone has ever seen?³² As if sensing the inadequacy of this first argument, Gersonides proceeds to the second level of his argumentation, where he offers several substantial proofs of a more philosophical nature. Like many of his arguments against the eternity hypothesis these proofs are also indirect, or *reductio ad absurdum*, proofs. One such proof is the argument from the vacuum.

Nature abhors a vacuum -- so nearly everybody believed from Aristotle until Torricelli's experiments showed otherwise.³³ Gersonides puts this fundamental theorem of medieval physics to good use and shows that the doctrine of creation *ex nihilo* implies the existence of vac-

³¹Abraham ibn Ezra has been taken by some commentators to have maintained the Platonic view; but this interpretation was challenged by Nachman Krochmal (Abraham b. Ezra, *Commentary on Genesis, 41:1*. J. Gutmann, *Philosophies of Judaism*, 120. N. Krochmal, *Moreh Nebukei ha-Zeman*, ed., S. Rawidowicz. (London, 1961) 306, 324).

³²Saadia Gaon, *Book of Beliefs and Opinions*, Book I, Introduction.

³³There were several medieval thinkers who were sympathetic to the concept of a vacuum, especially Hasdai Crescas [H. Wolfson, *Crescas' Critique of Aristotle*, (Cambridge, MA., 1929), chap. 2]. For a good summary of the literature in medieval Latin authors see Edward Grant's *Much Ado About Nothing: Theories of Space and Vacuum From the Middle Ages to the Scientific Revolution*, (Cambridge, 1981).

uum both before and after the creation of the world. To see how this is so let us perform the following thought-experiment. Imagine how things were when God alone existed. If we say that He created a finite universe out of nothing, ³⁴this would mean that the place now occupied by the universe was originally one part of *empty space*, which prior to creation was completely void of any bodies. An ante-mundane vacuum is thus implied by creation *ex nihilo*. ³⁵Nor is this all. Even after the universe has been created, a vacuum *outside* the world would still exist. For a vacuum is, according to Aristotle, empty space that can be occupied by bodies; and since the universe is finite, it would be surrounded by the original void. ³⁶Creation *ex nihilo* is then incompatible with some of the most well-trenched scientific beliefs of the Aristotelian tradition. The Platonic theory of primordial matter is therefore the acceptable alternative. Provided that it is properly understood, this theory, Gersonides will maintain, is not only scientifically adequate but can be reconciled with Scripture. As Maimonides already indicated, Scripture is pliable enough to fit many scientific theories, and the Platonic hypothesis of the primordial matter is Scripturally acceptable because it doesn't rule out miracles. ³⁷Later in Book 6, part 2 Gersonides will show in detail how the Platonic theory is actually taught by Scripture.

In Book 6, part 1, chapter 18 Gersonides considers nine specific objections to his version of the Platonic theory of creation and replies to each of them. One of them is an old objection that appears in Saadia and which expresses a deep religious conviction about the singularity and supremacy of God. If it is admitted that along with God there existed a primordial matter which was fashioned by God into our world, then this matter is *equally eternal* with God! This theory impairs one of God's attributes, His eternity, which has been traditionally believed to be unique; indeed, we seem to have introduced another divinity. ³⁸This objection, Gersonides replies, claims too much. To be sure, this matter is, according to Gersonides, eternal; but it is in no way comparable to God. For unlike God it is formless, passive, imperfect and the source of evil. Indeed, it is just a notch above non-being. All this eternal matter does is to provide the material substratum from which our universe is created. As Plato already suggested, the perfection and goodness exhibited by the universe stems not from this matter, which is recalcitrant to the

³⁴The universe is for Aristotle and most medievals finite in magnitude. Aristotle, *Physics, III:4-6; On the Heavens, I:5-7*.

³⁵Aristotle, *On the Heavens, III:2*. Gersonides, *The Wars of the Lord*, Bk. 6, pt. 1, chap. 17.

³⁶This is Stoic cosmological theme. J. von Arnim, *Stoicorum veterum fragmenta*, (Leipzig, 1905-1924), 4 vols., I, 95c, II, 524a.

³⁷Maimonides, *Guide, II:25*.

³⁸Saadia Gaon, *The Book of Beliefs and Opinions*, Bk. I, chap. 2.

reception of beauty and order. ³⁹All perfection derives, Gersonides argues, from God and the other separate, incorporeal intellects, not matter. Thus, the eternity of matter doesn't amount to much, and the doctrine of creation out of matter should not occasion any theological misgivings about the uniqueness of God.

Although the main concern of Book 6 is the question of creation, Gersonides does devote one chapter to a correlative question: if the universe had a beginning, does it have an end? Plato claimed that despite having a beginning the universe is *everlasting*. However, Plato suggested, the everlastingness of the universe is dependent upon the will of the divine craftsman who was responsible for making the world. This was also the *opinion* of Maimonides, and I stress the word "opinion". For in this matter Maimonides treaded cautiously, confining himself to citing several Biblical and Rabbinic passages that to him indicated the everlastingness of the world. He did not attempt to argue for this view on philosophical grounds; nor did he endow this opinion with dogmatic status such that anyone who denied it would be ruled out of the Jewish faith. And like Plato he suggested that the everlastingness of the universe is dependent upon God's will. In other words, just as it is a contingent fact that the universe was created, so too it is a contingent fact that it will continue to exist in the future. ⁴⁰

Gersonides opts for a stronger thesis. He claims that the universe is *indestructible*, i.e., it *cannot* be destroyed; and he attempts to prove this claim by rigorous philosophical arguments. ⁴¹In defending this thesis Gersonides not only took upon himself the burden of providing philosophical proofs for this thesis, whereas Maimonides did not, but he also had to confront Aristotle's strong attack against the Platonic thesis that the universe is everlasting albeit created. For Aristotle, if anything has a beginning it has an end, and conversely. Thus, for him, the universe is either eternal or destructible; there is no *tertium quid*. ⁴²Although it was relatively easy for Gersonides to come up with several persuasive arguments for the thesis of indestructibility, which he presents in a moderate-sized chapter, it was by no means an easy task to refute Aristotle's counter-arguments, which he attempts to do in a very long and perhaps

³⁹Plato, *Timaeus*, 31b.

⁴⁰Plato, *Ibid.*, 41a-b. Maimonides, *Guide*, II:27-30. For a different interpretation, see Roslyn Weiss, "Maimonides on the End of the World." *Maimonidean Studies* 3 (1992-93): 195-218.

⁴¹Gersonides, *op.cit.*, Bk. 6, pt. 1, chap. 16. S. Feldman, "Platonic Themes in Gersonides' *Cosmology*, *Salo Baron Jubilee Volume*, (Jerusalem, 1973) vol. 1; *idem*, "The End of the Universe in Medieval Jewish Philosophy", *Association for Jewish Studies Review*, 11 (1986), 53-77.

⁴²Aristotle, *On the Heavens*, I2: 9-12.

the most difficult chapter in the entire book. ⁴³

Gersonides proves the indestructibility of the universe from two different angles: from the perspective of the universe and from the perspective of God. If something is destructible, it must in principle be the kind of entity that is *capable of* destruction; i.e., there must be inherent in this entity some cause or principle of its potential destruction. Now, Gersonides asks, what could this principle be? According to Aristotle the heavenly bodies consist of a unique substance that is simple and perfect, not subject to any kind of real change other than change of place. In particular, the heavenly bodies are not composed of contrary elements that for Aristotle are the

ultimate causes of destruction and decay. ⁴⁴And if we turn our attention to God, we reach the same result. For if God could destroy the universe, He would have to have a good reason for doing it. ⁴⁵But can He have a good reason for destroying what He has created? Clearly not. For if He had, this would mean either that the universe was created imperfectly and had to be redone, or that God is subject to fits of anger or remorse which bring Him to the point of destroying that which He Himself has made. In the first case, God would be imperfect; in the second case, He would be not only imperfect but vindictive, whimsical and arbitrary. Both of these suggestions are of course absurd. Thus, there is no way one could impute to God a sufficient reason for destroying what He has created. After all, the Bible says of God's creation that "it was very good". The universe *must* be indestructible.

But *can* that which is generated be also indestructible? Aristotle argued that whatever has a beginning has an end. Now Gersonides turns his attention to meeting Aristotle's powerful attack against the Platonic-Gersonidean theory that the universe has a beginning but no end. Among the many and extremely difficult arguments in Book 6, part 1, chapter 27 two in particular are especially interesting and important. Aristotle equates the concept of corruptibility with the notion of contingency. Since Gersonides admits that the universe is contingent, i.e., it is created by God out of His own free will, it is, Aristotle claims, corruptible, and thus not everlasting. For Aristotle then the following equations are true: eternal = necessary; corruptible = contingent. Gersonides rejects this argument. The proofs for creation have shown that the universe is not necessary; it is indeed contingent. But it doesn't follow that just because something is contingent it is thereby corruptible. The universe is contingent simply by virtue of its being not eternal. However,

⁴³Gersonides, op.cit. , Bk. 6, pt. 1, chap. 27.

⁴⁴Aristotle, *On the Heavens*, I:3 and 9. Gersonides, op.cit., Bk. 6, pt. 1, chap. 16.

⁴⁵Here we have an anticipation of Leibniz's Principle of Sufficient Reason. Leibniz, *Letters to Clark*, V, paragraphs 73-76.

from that fact alone it doesn't follow that it is destructible. Contingency in this context means merely that something does not exist necessarily or for eternity. Aristotle seems to have conflated, perhaps intentionally, the concepts of eternity and incorruptibility, or everlastingness. The former is a stronger concept, which Gersonides rejects for the world; the latter is a weaker notion which he argues is true of the universe. An eternal world is obviously an incorruptible one; but the converse is not true. Analogously, a corruptible universe is a contingent one, but the converse is not true. The notions of contingency and corruptibility are then not equivalent.

In the second argument a principle that has appeared earlier in our discussion -- the idea that no infinite magnitude is larger than another infinite -- plays a prominent role. Aristotle argued that since the world for Plato (and for Gersonides) is everlasting it exists for infinite time *a parte post only*, whereas in Aristotle's model of the universe the world is infinite both *a parte ante* and *a parte post* -- in the past as well as in the future. This means that the duration of Plato's and Gersonides' world amounts to a "shorter infinite" than is postulated in Aristotle's cosmology. Yet all infinities are supposed to be equal in magnitude! To this argument Gersonides replies firstly that it can be turned against Aristotle himself. After all, if we assume the world to have infinite duration in both directions, we can always pick out a moment on the time line that divides time into two parts, each one of which is infinite yet smaller than the whole of infinite time. Aristotle is in the same boat as Gersonides. Secondly, Aristotle's whole mode of argumentation assumes that it makes sense to talk about time before the creation of the world. He envisages the situation

such that we have independently of the world infinite time in both directions and then, according to Plato and Gersonides, the world is created and exists infinitely *a parte post*. Thus in Aristotle's construal of the hypothesis of Plato and Gersonides the infinite duration *a parte post* of the universe is a portion of the infinite length of time in both directions, and this generates the paradox that one infinite is shorter than another. But, Gersonides replies, the assumption that time exists before the creation of the world is false. Time is created along with the creation of the universe; there is, therefore, no infinite time *a parte ante* which together with the infinite future time of the world make up an infinite magnitude that is "greater" than the infinite duration *a parte post* of the world. Indeed, as we have already seen from Gersonides'; proofs for creation, time is *not* infinite in duration *a parte ante* at all, and hence is infinite only in the future.

One final point to complete Gersonides' cosmology. If our world is indestructible, is it also *unique*? Or, are there some other worlds coexisting simultaneously with the one in which we live? Indeed, if there are

-205-

such other worlds, is there life on them? We have now raised the question of the plurality of universes, a topic that has become increasingly relevant in our space-travel age, but which was not unknown to our medieval ancestors. Indeed, the question was discussed by the ancient Greek cosmologists. In response to the atomist thinkers, such as Democritus who had suggested that there are other worlds besides our own, Aristotle argued that there is *only one universe*, "outside" of which there is absolutely nothing, for our own world contains all the matter there is.⁴⁶ The debate continued after Aristotle when the Epicureans rejected his unicity claim and defended the older atomist hypothesis of a plurality of universes located in an infinite void.⁴⁷ During the Middle Ages this cosmological question receded into the background as the main concern was with our own world's beginning. Perhaps because the Bible and Koran were silent on the issue most medieval cosmological speculations ignored or denied the possibility of plural worlds. But this silence ended in the late thirteenth century, when in 1277 the Bishop of Paris issued a list of philosophical errors, among which was the Aristotelian dogma of the world's unicity. Why was this proposition now condemned? The Bishop of Paris regarded this thesis as an infringement upon God's omnipotence: if there can be only one world, this would imply that God is impotent. So anyone who really believes in divine omnipotence ought to be at least open to the possibility of plural worlds. Throughout the fourteenth century increasing attention was given to this question in the Latin philosophical and theological literature.⁴⁸

Curiously, not many echoes of this debate were heard in the contemporary Hebrew or Arabic literature. Maimonides ignores it altogether. But Gersonides devotes one chapter to it in *The Wars of the Lord*.⁴⁹ Although it is possible that he was motivated to take up the question by the contemporary debate in France, it is more likely that he was stimulated by Aristotle's own analysis, which he had commented upon earlier in his Epitome of Averroes' commentary on Aristotle's *On the Heavens*. In that super-commentary Gersonides had remarked that he found Aristotle's argument to be inadequate, although the general thesis, he claims, is true. So in *The Wars of the Lord* Gersonides returns to this question and defends Aristotle's unicity thesis within the framework of his own general cosmological theory.

The question is particularly vexing to Gersonides because of a special

⁴⁶Aristotle, *On the Heavens*, 12:8-9.

⁴⁷Lucretius, *On the Nature of Things*, Book II, 1023-1089.

⁴⁸For an excellent discussion of this problem see Steven Dick, *Plurality of Worlds*, (Cambridge,

MA., 1982), especially chapters 2 and 3.
⁴⁹Gersonides, *The Wars of the Lord*, Bk. 6, pt. 1, chap. 19.

-206-

feature of his claim that our world was created out of some primordial formless matter. He asks the question whether it is possible that this matter was not used up when God made our world; perhaps there is some of it still present outside our world. ⁵⁰Right here he departs from Aristotle's contention that since all the matter there is in our world, there can be no other universe. Accordingly, Gersonides defends the unicity thesis by means of other kinds of argument, some astronomical, others philosophical. To illustrate each kind I shall present one such argument.

Suppose there are many worlds. Since the surplus matter that is between these worlds is transparent, ⁵¹we should be able to see these other worlds. There is no compelling reason to believe that all such worlds are too far from us to see at least one of them. Moreover, our own moon should not suffer any loss of illumination, since it could receive illumination from the sun or stars of some other world. But of course this is all false! We don't see any other world and our moon does suffer a decrease of illumination every month of the year.

Now, let us consider the following philosophical argument against the plurality of worlds. Why is there plurality within a species in the first place? As both the Bible and science teach us, there are many individuals in a species in order for the species to survive. Consider what would happen to a species that reproduces only one offspring every ten years. Now our world has been proven to be indestructible. Thus, as a species it doesn't need to be multiplied in order to survive; hence, a plurality of worlds would be otiose. Where many is not needed, let us be satisfied with one. Here the Principle of Parsimony is to be followed to the letter of the law. After all, one God, one world.

Cosmology was clearly one of Gersonides' main concerns -- Book 6 is the longest part of *The Wars of the Lord*. In his cosmology Gersonides expresses some of his radicalism: his vigorous critique of the traditional doctrine of creation *ex nihilo* and his strong defense of the world's indestructibility departed from the accepted views of many of his predecessors and successors in medieval Jewish philosophy. Hasdai Crescas took strong exception to these Gersonidean *novellae* and subjected them to a sharp critique. ⁵²Isaac Abravanel too followed Crescas' lead and relentlessly attacked Gersonides' more "heterodox" cosmological ideas. ⁵³To this very day traditional Jewish cosmological speculation tends to

⁵⁰Gersonides, *The Wars of the Lord*, Bk. 6, pt. 1, chap. 18, the first difficulty.

⁵¹Gersonides proves this earlier in Bk. 5, pt. 2, chap. 2.

⁵²Crescas, *Or Adonai, (The Light of the Lord)*, Book III, principle 1, chapter 3; Book VI, first and questions.

⁵³I. Abravanel, *Mif'alot 'Elohim, Book IV, chap. 3, Book VIII, chaps. 3-4, Book IX, chapter 7; Commentary of Genesis, chap. 1.*

-207-

defend the *ex nihilo* conception of creation. Nevertheless, here and elsewhere Gersonides was not afraid to defend a position that he believed true philosophy required. The only problem that remained was the task of reconciling Scripture to this philosophically justified belief. This he undertakes in the first eight chapters of Book 6, part 2.

Part 2: A Philosophical Reading of Genesis 1

Ever since Philo, the first chapter of Genesis had become an exercise in philosophical exegesis. Philo himself wrote several treatises showing how the opening chapter of the Bible can yield important cosmological truths that coincide with some of the ideas in Plato's philosophy.⁵⁴ Maimonides too saw fit to read Genesis 1 in the light of his own philosophical ideas, which were more Aristotelian than Platonic. Thus, part 2, chapter 30 of *The Guide* is his version of *De opificio mundi*, a theme that Philo, Origen, Augustine, Philoponus, and Saadia had introduced to and made central for religious philosophy. Gersonides, then, is part of a venerable tradition of philosophical exegesis of the biblical account of creation.

What makes his interpretation significantly different from his illustrious predecessors is his rejection of creation *ex nihilo*, which was a dogma for Augustine, Philoponus, and Saadia and the traditional Jewish doctrine of creation according to Maimonides. Having shown philosophically that this idea was false, Gersonides felt that it was especially important, indeed incumbent upon him to demonstrate in detail that the Bible does not explicitly teach creation *ex nihilo* and that the creation story of Genesis can be read just as easily, perhaps even more so, in terms of the theory of creation out of "the body that doesn't preserve its shape." This is the plan of the first eight chapters of Book 6, part 2. It is also one of the themes in Gersonides' *Commentary on The Torah*, which he wrote after completing *The Wars of the Lord*. Since the *Commentary* expresses the main philosophical conclusions of *The Wars*, the former can be read as a useful complement and ancillary to the latter. Let us now examine a few of the important themes in the first eight chapters of part 2.

Besides the principle of creation out of the primordial shapeless body, there is another basic theme to Gersonides' exegesis of Genesis 1: the act of creation did not itself take time, especially not six days. Despite appearances Scripture does not, Gersonides insists, commit us to the naive, indeed false, belief that creation required six temporally distinct events. This may be what we teach children in the first grade of religious

⁵⁴Philo, *On the Account of Creation According to Moses*; Allegorical Interpretation of Genesis I.

school; but it is not the correct understanding of the Bible. This is of course an old theme. Philo and Maimonides had explicitly enunciated the same principle. For all these thinkers the idea that God created the world in six distinct temporal moments is incompatible with the belief in divine perfection. We have to appreciate the ambiguity of the first word of the Bible: "bereshit". To render it "In the beginning" is merely to highlight the multi-faceted character of this word. For, as Aristotle had noted, the word "beginning" has a variety of meanings, many of which are nontemporal.⁵⁵ Consider, for example, the relationship between the axioms of a theory and the resultant theorems. In an important sense the axioms are the "beginnings" of the theory, and that is why we often use the term "principle", from the Latin word for "beginning" -- "principium", as a synonym for "axiom". Now it is obvious that the axioms are *not temporally* prior to the theorems, although they are of course logically prior. Gersonides devotes the second chapter in part 2 to a similar discussion of the word "reshit", pointing out several of its connotations, with the intention of removing the temporal interpretation commonly associated with this word. In Genesis 1:1 the term "reshit" signifies *causal priority*: X is causally prior to Y if Y depends upon X for its existence or efficacy. Such a relationship is temporally neutral.

If then the act of creation did not take time, how are we now to understand the opening statement of Genesis 1? Actually, we need to construe the first three verses as one complex sentence, whose main clause is verse 3: "Let there be light". The first verse is a subordinate clause indicating that although when God made the universe He did so by creating simultaneously all the celestial and the earthly domains, He created them such that they exhibit an order governed by the relation of causal priority, the first element of which is a sub-domain of the celestial world, "light", i.e., the world of the separate intelligences, or in biblical language, the angels. ⁵⁶ Indeed, this is why the heavens "precede" the earth: the heavenly bodies and their incorporeal, separate movers are causally prior to earthly bodies, since the former move the latter and are responsible for their generation. And "preceding" everything in the creaturely world was light. ⁵⁷

The Bible closes the creation of light with the phrase "one day". Gersonides translates this term as "first level" (madregah) and he uses

⁵⁵ Aristotle, *Metaphysics*, V:II.

⁵⁶ Gersonides departs here from rabbinic traditions that assign the creation of the angels either to the second or fifth days (Louis Ginzberg, *Legends of the Jews*, (Philadelphia 1913), vol. 1, page 16. Augustine too believed that the angels were created on the first day (Augustine, *The City of God*, Bk. XI, chap. 9).

⁵⁷ See Charles Touati, "*La Lumière de l'intellect, création du Premier Jour: L'exégèse de Genèse 1, 1-3, chez Gersonide*", in: *In Principes: Interpretations des premiers versets de la Genèse*, (Paris, 1973), 37-45.

this latter term for each of the following six phases of the divine creative act. Again, the temporal connotation of the story is suppressed. So when he continues to explain the "second day" of creation, we have to understand this chapter of the biblical cosmogony not as a subsequent episode in a creative process but as a *distinct dimension of one creative act*. The "second day" of creation is for Gersonides that phase wherein the heavenly bodies as such were created, since the first phase consisted in the creation of their movers. Thus, for Gersonides the biblical term "raqi'a", usually translated as "firmament", refers to the whole celestial domain. Etymologically analyzed, the word "raqi'a" connotes something put into shape by beating or some other process. The key idea here is *shape*. The heavenly bodies have distinct and stable shapes. Now it is at this stage of creation that Gersonides' doctrine of creation out of matter is especially relevant. Let us take a closer look at the biblical description of the creation of the heavenly domain.

The heavenly bodies are described as being created "in the waters", and once created these bodies separate the "upper waters" from the "lower waters". ⁵⁸ Now what are these waters within or from which the heavenly bodies were created? This is nothing other than "the matter that doesn't keep its shape", the primordial formless stuff out of which the physical world was made, the astronomical importance of which was discussed by Gersonides in Book 5, part 2, chapter 2. Unlike the heavenly bodies this watery stuff has no intrinsic shape or form. In creating the universe God literally *in-formed* parts of this matter, thus producing the heavenly and earthly bodies, the former causally prior and superior in substance to the latter. As if unconsciously sensing the novelty of these ideas, Gersonides cites a number of biblical and rabbinic texts to support this reading of the story of the creation of the *raqi'a*. ⁵⁹

We shall not pursue here Gersonides' depiction of the remaining phases of the divine cosmogony. Our discussion of the first two stages of this story have indicated several of its main themes. In one instant God created the whole universe -- the heavens and the earth, and all things

therein -- out of the "matter that doesn't keep its shape", the primeval waters. Each "day" represents a distinct stage in the creative act, wherein that which is causally prior is depicted as coming "before". But, as we have seen, the language of temporal priority has to be suppressed. The distinct causal stages of the creative act indicate to us the *formal structure*

⁵⁸Genesis, 1:6-8.

⁵⁹J. Staub gives a detailed discussion of this topic in his *The Creation of the World According to Gersonides*, (Chico, CT., 1982).

-210-

of the universe, its "rational order", to use one of Gersonides' favorite phrases. Each such stage constitutes a distinct dimension in a hierarchy of formal patterns all of which are unified in the rational plan in the divine mind. This unity is biblically expressed by the phrase "and it was good."

-211-

BOOK SIX

Part I -- CREATION OF THE UNIVERSE

Wherein we shall complete our investigation of this topic and remove, as far, as we can, the difficulties that arise in this question.

Part 2 ^a

Wherein we shall show that there is a [complete] agreement between our philosophical conclusions and the Torah. In addition, we shall explain the discussion of creation described in the Torah and afterwards address ourselves to two theological questions, which we shall investigate according to what philosophy and the Torah stipulate. These questions are: (1) How are signs and miracles possible; and how and through whom are they brought about, and who is the efficient cause? (2) How are prophets tested?

Part 1

CHAPTER I

The difficulties pertaining to this inquiry.

CHAPTER II

The views of our predecessors on this topic.

CHAPTER III

Arguments in favor of these various views.

CHAPTER IV

Arguments showing that the above arguments in favor of these views are not valid.

CHAPTER V

A discussion of which things should serve as starting points of this inquiry.

CHAPTER VI

Features that distinguish a created object from a non-created object.

CHAPTER VII ^b

A demonstration showing that the heavens are created by virtue of the features exhibited by them, which features are those conditions exhibited by all created things as such.

CHAPTER VIII

A proof showing that the heavens are created by the second of these features [mentioned in Chapter VI].

CHAPTER IX

A demonstration of the creation of the heavens from the third of the above-mentioned features.

CHAPTER X

-213-

An explanation of the nature of time and of what kind of existence it has.

CHAPTER XI

The demonstration that time is created.

CHAPTER XII

The demonstration that motion is created.

CHAPTER XIII

The demonstration that the inhabitable portion of the Earth has a beginning.

CHAPTER XIV

A discussion of John Philoponus' proof creation from the impossibility of an infinite force residing in a finite body.

CHAPTER XV

Another proof for creation that provides additional evidence for and completes our previous proofs.

CHAPTER XVI

The universe is indestructible.

CHAPTER XVII

How was the universe created?

CHAPTER XVIII

A discussion of the difficulties inherent in this latter issue.

CHAPTER XIX

A proof of the unicity of the universe.

CHAPTER XX

A resolution of Aristotle's objection [against creation] from the nature of time.

A discussion of the argument from the nature of eternity, generation and destruction.

CHAPTER XXVIII

A solution of a problem that arises from Aristotle's claim that it is not possible for all things to be generated.

CHAPTER XXIX

Some concluding remarks about the philosophical topics included in this treatise and a tribute to God, from Whom everything derives.

-215-

CHAPTER I

IT is proper that we first indicate the major difficulties pertaining to this question. This will guide us to some extent in the completion of our inquiry ^a into this matter, for when we know the difficulties in an inquiry we are on the path that will lead us to the attainment of the truth on this question.

The considerable ^b diversity of opinion that obtains amongst the investigators, even to this day, on this question indicates its difficulty. This diversity shows that there are many arguments drawn from the nature of the world in favor of each of the rival theories. Such a situation makes an inquiry into this topic quite difficult.

There is a feature of this question that most certainly reveals the inherent difficulty of this problem. In order to determine whether God created existent things after they had not existed or whether there has been no creation at all, we examine all existent things. Now it is obvious that when we want to understand scientifically any of the properties of a thing -- i.e., whether it is true of that thing or not -- we must first know the essence of that thing and its properties ^c; for it is by virtue of the essence and the properties that we understand that which we are investigating. It is [therefore] evident that someone who wants to make a comprehensive study of this topic should first know the essence and the properties of that which he is investigating as far as it is humanly possible. This means that it is incumbent upon such an investigator to know the nature of existent things in their entirety and their various properties, so that he will be able to determine if anything in reality exhibits a property that entails the eternity of the world, or if there is some feature of reality that entails the creation of the world, or if there is no such feature that entails either creation or eternity. Accordingly, someone who lacks the requisite information on these matters will thereby fail to make the most complete investigation possible on this topic. But it is evident that the most complete investigation humanly possible into the nature of reality and its properties is difficult to achieve.

What complicates matters more is that it will be necessary for the investigator ^d to have knowledge of the First Cause, at least as far as this is possible. For, since this inquiry will lead us to consider whether it is possible for God to exist first without the universe and afterwards to have created it, or whether it is necessary for the universe to exist eternally with Him, it is clear from the preceding that anyone who wants to

-217-

make a comprehensive treatment of this issue (as far as possible) should know the essence of God, as far as this is possible, so that he will be able to arrive at a true judgment whether God ^e can be active at one time but not another or whether this is impossible. But this makes the whole

inquiry difficult, for our knowledge of the essence of the First Cause is necessarily quite inadequate, as is obvious from what has been said previously.¹

Furthermore, it is difficult to determine which of the substances and the properties of existent things yield the requisite information on this topic; for this is a prerequisite for a complete treatment of this question. But if we lack this information, our reaching the truth with respect to it will be sheer accident.

The issue is even more^f complicated because Aristotle himself admits the difficulties of this problem, as Maimonides tells us in the *Guide*: "As for matters concerning which we have no argument or that are too great in our opinion, it is difficult for us to say: Why is this so? For instance, when we say: is the world eternal or not?"² This shows that even Aristotle found this question extremely difficult such that he was quite perplexed, notwithstanding all his many proofs for the eternity theory. Indeed, this was undoubtedly due to the fact that Aristotle realized that there were many arguments affirming that the universe is generated and that his own arguments did not yield the truth in this matter in every respect, as will indeed be shown later. Now if this question was difficult for Aristotle with all his wisdom, how much more so will it be for those who are inferior to him in knowledge!

¹Bk. 5, pt. 3, chap. 12.

²Maimonides, *Guide, II*, C.15; Aristotle, *Topics*, 104b 15-17. Gersonides quotation is *not* exactly the same as the Hebrew of the Ibn Tibbon translation.

CHAPTER II

We have found considerable diversity on this topic among our predecessors. There is the theory that asserts an infinite series of worlds each created after the other.¹ Then there is the view that the universe has been created but that only one universe was created. There are two versions of this latter view: one maintains that the universe was created from something -- this is the view of Plato and his more recent followers; the other maintains creation from absolutely nothing²-- they are the earlier thinkers of the Kalam, such as John the Grammarian³ (as we are told by Averroes in his *Commentary on the Metaphysics*, and [the later] Kalam theologians followed them. The distinguished philosopher Maimonides and others of our faith have also inclined toward this [latter view]. Finally, there is the theory that the universe is eternal, which is the view of Aristotle and his followers. Now it is obvious that all this diversity stems either from the facts of nature upon which they established their proofs or from religious pressures, or perhaps from both of these causes.

¹This theory was common amongst the Stoics (Cicero, *De Natura Deorum*, II:46.

²*Hoveh milo davar bemuhlat*. The phrase *milo davar* corresponds to the Arabic *la min shai*, used by Maimonides. Maimonides occasionally adds the terms *almahd* and *almutlaq*, whose Hebrew equivalent is *bemuhlat* (Maimonides, *Guide, II*, chap. 13).

³John the Grammarian is the name given in the Arabic-Hebrew literature to John Philoponus (ca. 490 - ca. 570), a Christian philosopher-theologian in Alexandria, who wrote important critical commentaries on Aristotle and several polemical treatises against Aristotle and Proclus. After many centuries of neglect he has been receiving his due, primarily as the result of the work of Richard Sorabji and his associates [*Philoponus and the Rejection of Aristotelian Science*, ed., R. Sorabji (Ithaca, 1987) and R. Sorabji, *Time, Creation, and the*

Continuum (Ithaca, 1983). H. Davidson, *Proofs for Eternity, Creation, and the Existence of God in Medieval Islamic and Jewish Philosophy*, Oxford University Press: New York, 1987), chap. 4].

-219-

CHAPTER III

THESE various theories seem to us to have some initial plausibility. For the view that there is an infinite series of generated and destroyed worlds ¹ seems to have support from the following considerations. First, experience shows that all things in the sub-lunar world are generated and destroyed, and therefore it may be thought by induction that the world in its entirety must be generated and destroyed. Accordingly, since it is not proper for God to be active at one time and inactive at another time, it seems to follow that He continually generates and destroys universes *ad infinitum*, just as there is an infinite series of men.

A second argument from the nature of time asserts the impossibility of the absolute creation of time. Aristotle mentions two supporting arguments for this thesis. If time were generated it would be generated in time, which shows that time has no origin. Secondly, if time were generated, there would be in actuality a [first] instant from which it began; but this is impossible, since in time there is nothing except what is potential. ² Consequently, since it has already been established by the first argument that the universe is generated, it is necessary that there be a preceding world, and so on *ad infinitum*, in the same way as time is ungenerated.

Thirdly, from the very nature of motion it has been thought that the absolute generation of motion ^a is absurd, as Aristotle claims in his attempt to prove the eternity of the universe. For if it is assumed that the universe is generated, then there must have been a preceding world, and so on *ad infinitum*, just as motion itself is ungenerated.

Fourthly, it is impossible for the primary matter to be bereft of some form; rather it continually assumes various forms, each replacing the other in such a way that it is never devoid of some form. Since it is obvious that nothing is generated from nothing nor annihilated into nothing but that there is always matter, it would follow from this that prior to this present world there was another world, just as the primary matter must have some form.

¹The cosmology of many of the Stoic philosophers asserted the continual generation and regeneration of finitely enduring worlds. See the recent collections of sources and accompanying notes compiled by A. Long and D. Sedley, *The Hellenistic Philosophers*, (Cambridge, 1987), vol. 1, 274-79, 308-13, and B. Inwood and L.P. Gerson, *Hellenistic Philosophy*, (Indianapolis, 1988), 96-125.

²Aristotle, *Physics*, VIII:1.

-220-

Fifthly, all generated things perish, as Aristotle has shown. ³ Accordingly, since the universe has been demonstrated to have been generated, it will also perish. This argument established the view of those who maintain the generation and corruption of the universe.

Sixthly, it has been claimed that the universe is generated and corruptible ^b since a finite body cannot possess infinite force, as has been demonstrated by Aristotle. ⁴ Therefore, the heavens are corruptible, since they are finite in size. If they were to possess an infinite force that would keep

them moving *ad infinitum*, we would have a finite body possessing infinite power, a consequence that has been assumed to be false. Thus, the heavens are necessarily corruptible. But if they are corruptible they are also generated, since Aristotle has shown that whatever is corruptible is generated. And in this way, it has been thought, the theory of the generated and corruptible nature of the universe has been established. This argument has been actually given by John the Grammarian, as is recorded in Averroes' *Commentary on the Metaphysics*.⁵

The theory that asserts the single generation of an incorruptible and ordered universe from some thing [and] from the lack of order also has some plausibility.⁶ Firstly, an intellectual principle would seem to be the cause of all things, as we can see from their^e order and perfection; indeed, we see them^d unified by virtue of this feature. Now this shows that *one* intellect is the principle of everything and is responsible for all the perfection and order exhibited in them. It is for this reason, I believe, that Plato maintained that the intellect is that which brought order out of disorder. And since we find that each thing is generated out of something, it is necessary to posit something out of which the universe is generated. But since we do not postulate beginning to motion, as has been previously mentioned, it was necessary [for Plato] to posit that prior to

³Aristotle, *On the Heavens*, I:12.

⁴Aristotle, *Physics*, VIII:10, 266a 25ff. H. Davidson, "The Principle that a Finite Body Can Contain only Finite Power", *Studies in Jewish Religious and Intellectual History Presented to Alexander Altmann*, (University of Alabama Press: Alabama, 1969) 75-92.

⁵Averroes, *Long Commentary on the Metaphysics*, XII, Arabic 1628-1629; Latin 324 B.

⁶Aristotle attributes this view to Plato. In *Physics* 209b10 Aristotle characterizes Plato's cosmogony as the creation of our world out of matter, which previously was in a state of disorder. The Greek verb *κοσκέω* connotes order; *κόσμος* means an ordered physical system. In *On the Heavens*, I: [10](#), [279 b 18](#), and [280 a 30](#) Aristotle claims that for Plato the world is everlasting, even though generated. This is correct, as Plato explicitly says in his *Timaeus* [31 b](#). The thesis that for Plato the world was created out of matter is, however, not uncontroversial. Plato does not use the term "matter" but such words as "receptacle" (*ὑποδοχή*) and "space" (*χώρα*) to refer to the "receiving", passive, factor in the making of the physical world. According to Francis Cornford, 'there is no justification for calling the receptacle "matter" -- a term not used by Plato' [F. Cornford, *Plato's Cosmology*, (New York, 1957), 181]. Nevertheless, the medievals generally followed Aristotle's interpretation of Plato. See also Sorabji, *Time, Creation, and the Continuum*, chap. 17

the generation of the world there was a state of irregular motion [in this matter].⁷ [Secondly, since the fifth body⁸ is such as to be incorruptible -it is evident that corruption is the result of matter, whereas form preserves a thing in its being as far as possible until the matter overpowers the form, which occurs when the passive powers of a substance overpower the active powers -- it is clear that the heavens are incorruptible; and so the universe at large is incorruptible.⁹ Now if it is objected that since the heavens are incorruptible^e they are not generated, since, as Aristotle argued, anything that is incorruptible^e is ungenerated, which is contrary to Plato's theory -- we say that this objection is not valid. For it has been demonstrated in Book 1 that there is something in the world that is generated yet is immortal and everlasting, i.e., the acquired intellect.¹⁰ Moreover, we shall show later that Aristotle's argument here is not valid.¹¹

Now the thesis of creation¹² *ex nihilo* also seems to have something in its favor. Our experience shows that whatever is generated is entirely generated from nothing. We find that all generated things are forms; for an object is not generated in so far as it is a body but in so far as forms are

generated in it that the body is capable of receiving, such as heat or cold or any other forms that result by means of the latter. Now since the form is generated *ex nihilo*, everything that is generated is generated *ex nihilo*. Thus, it would seem that it is possible that the world is generated *ex nihilo*. For ^f just as a form is generated *ex nihilo*, so ^g it is possible that matter is generated *ex nihilo*. Accordingly, since it has already been thought ^h [e.g., by the Stoics and Platonists] that the universe is generated, and further when it can be demonstrated, as Aristotle has shown, that the Platonic theory of generation from matter involves several insuperable difficulties, it follows that the universe should be posited as having been generated *ex nihilo*; for in this way it would seem, all of these difficulties are obviated. For example, according to Aristotle, the Platonic theory leads to the absurd consequence of an infinite possibility inher-

¹⁰Gersonides, *The Wars of the Lord*, vol. 1, Bk. 1, chaps. 10, 11, and 13.

¹¹*Infra*, Bk. 6, pt. 1, chap. 27.

¹²So far in this chapter I have been translating the Hebrew terms *hoveh*, *havayah* as "generated", "generation", which is a more neutral, as well as more literal, rendition of the Hebrew. However, now a specific theory of the world's origin is introduced into the debate that has been traditionally called "creation *ex nihilo*"; hence, I render here **hoveh** as "creation". I shall conform to this practice when this theory is being referred to, even though the Hebrew terms **hoveh** and *havayah* are used.

⁷Plato, *Timaeus*, 30A 2-6, 53A2-B5, 69B2-C2.

⁸The "fifth body" is the heavenly substance (Aristotle, *On the Heavens*, I:2-4).

⁹The heavenly substance is incorruptible since it has no passive powers (Aristotle, *Meteorologica*, IV:1).

ing in the primordial matter before the generation of the universe. Now, [on the *ex nihilo* theory] this absurdity is avoided, since no primordial matter is posited in which this possibility allegedly inheres, whereas the Platonic theory is subject to this difficulty. ¹³Thus, John the Grammarian, according to Averroesⁱ *Commentary on Aristotle's Metaphysics*, adopted the theory [of creation *ex nihilo*]. ¹⁴A further difficulty for the Platonic theory is that prior to its generation the world would be existing because of the irregular motion that exists prior to creation. ¹⁵But this difficulty too is avoided by the creation *ex nihilo* theory. I believe that it was for this very reason that Maimonides preferred the *ex nihilo* theory and claimed that it was the theory of our Torah; i.e., he assumed creation *ex nihilo* so as to avoid the difficulties that Aristotle raised against the theory of generation [in the Platonic version]. This is supported by the passage in chapter 25 of part II of his celebrated work *The Guide of the Perplexed*, where he says that the view of Plato also agrees with our Torah provided that it is philosophically acceptable.

[Further support for creation *ex nihilo* can be derived from the following consideration]. That a form is generated *ex nihilo* is evident. In generation there is no thing that changes in its very essence and [then] the generated form comes to be from it. Nor does the claim that a form is generated from another form like it imply that the generation of a form is from something. We do not say, for example, that the generation of a form by means of some craft according to the form in the soul of the craftsman is like the generation of viridis [i.e., copper dioxide] from copper. Rather, we say that the form in the craftsman's soul makes the form [of an artifact]; it does not decompose and [then] from it the form in the artifact arises. This is obvious. ¹⁶

¹³The absurdity is that since the possibility is infinite, at least *a parte ante*, it is eternal; but, according to Aristotle, an eternal possibility that is never realized is absurd, for all

possibilities are eventually realized in infinite time [Aristotle, *On the Heavens*, I:11-12. J. Hintikka, *Time and Necessity*, (Oxford, 1973). S. Waterlow, *Passage and Possibility*, (Oxford, 1982).

¹⁴Philoponus' most detailed discussion of creation is found in his *De aeternitate mundi contra Proclum*, ed., H. Rabe (Leipzig, 1899). See Sorabji, *Time, Creation, and the Continuum*, chaps. 13-14; S. Feldman, "John Philoponus on the Metaphysics of Creation", In: *A Straight Path: Studies in Medieval Philosophy and Culture, Essays in Honor of Arthur Hyman*, ed., R. LinkSalinger (Washington DC 1988), chap. 7.

¹⁵If, as Plato admits, there is irregular motion before generation, there must be something moving, even irregularly. This something is in some sense a world (G. Vlastos, "The disorderly motion in the Timaeus" and "Creation in the Timaeus: is it a fiction?", in R.E. Allen, ed., *Studies in Plato's Metaphysics*, (London, 1965).

¹⁶In this argument Gersonides concedes one point to the defenders of creation *ex nihilo*: in some sense one can say that when a natural substance or artifact is generated the form is generated from no other thing, i.e., matter; rather, the form is generated from the absence of that form, or the privation (*στέρησις*) of that form. The privation can therefore be regarded as non-being. Aristotle calls this type of generation "substantial generation" (Aristotle, *Physics*, I:8; V:1; *On Generation and Conception*, I:4. Wolfson, *Crescas' Critique of Aristotle*, 514-21). The form is then not generated *from* matter, although it is in matter (W. Charlton's commentary to his edition of Aristotle's *Physics I-II* is very useful. Oxford University Press: Oxford, 1970).

-223-

The theory of the Mutakallimun, [or the Kalam] supports this view; i.e., they claim that the universe is generated out of atoms [*halaqim bilti mithalqim*] and they advance^k this theory in such a way that God makes the world continually, as Maimonides reports.¹⁷ They believed that it was proper for the world to emanate continually from God. Otherwise¹, God would be the agent only at the [initial] moment in which He created it. Hence, they made God an agent in this way in order to attribute to Him the continual generation of existent things. Nevertheless, this theory rests upon many false premises, as Maimonides has pointed out. In addition, on this view there would not be an absolute generation of the whole universe [i.e., at one moment]; for they claim that God is continually making it. This entails, as is evident, that the universe does not enter into existence at one particular moment but that its existence continually emanates from God.¹⁸

Finally, let us consider the theory of Aristotle, in behalf of which there are many arguments. Firstly, it would seem that there cannot be an absolute beginning of time. For if time were generated it would be generated in time; and it would therefore follow that there was time before the first time, which is absurd. Hence, motion is eternal and that which is moved is eternal; for time is inconceivable without motion and motion is inconceivable with something moved. Now, since time can be infinite only if it is assumed that there is one, continuous and circular motion, as Aristotle has proved, there must exist an eternal body continuously moving in circular motion. By an analogous argument it can be demonstrated that time has no end. For if it has an end it would terminate in time, and so time would exist after its cessation, [which is absurd]. Thus, Aristotle concludes that time is eternal and that there is a body moving eternally in a circle.¹⁹

Secondly, the absurdity of an absolute beginning of time [can be shown in another way]. Such an absolute beginning would imply the

¹⁷Maimonides, *Guide*, I:73, Sixth Proposition. Touati, *La Pensée*, 178.

¹⁸The Kalam physics of Maimonides' day was atomistic. In particular, time and all magnitudes

are discrete, i.e., discontinuous. Accordingly, no property of anything endures for more than one moment; it has to be re-created at another moment. The whole universe then would be re-created at each moment (Sorabji, *Time, Creation, and the Continuum*, chaps. 23-25). This was also Descartes' view, since he too held that time was a discrete quantity, although he was not an atomist (Descartes, *Meditations, III; Principles of Philosophy, II:20*).

¹⁹ Aristotle, *Physics, VIII:1-8*.

-224-

actual existence of a [first] instant from which time itself would originate. But the nature of the instant is, as it seems, to divide^m the before and the after. Now, if this is so, there is no instant from which time originates absolutely; for if this were possible, there would be an instant that does not divide the before from the after in time. But this is false given the nature of the instant. Moreover, the person who says that time is generated must use language that indicates the existence of time *before* it comes into existence. For if time at first did not exist, and afterwards it does exist, and since before and after are obviously and necessarily timeⁿ, time would exist^o before its generation. And the same is true if it is assumed that time is destructible. For the destructible is that which is non-existent after it existed; and in using the term "after"^p we [have uttered a word of] temporal discourse. Thus, Aristotle asserts that time is eternal. And it is evident from the preceding argument that it follows from this that the universe is eternal. ²⁰

Thirdly, since locomotion^q is the primary kind of motion, as Aristotle has shown, ²¹ and since such motion necessarily terminates in a first moving thing that moves by itself, ²² it would follow that, if the heavens were generated, that there would be a body with local motion to which their generation would be traced. And the same is true if the latter body is assumed to be generated. Now it is impossible for this process to continue infinitely; for it is impossible for there to be an infinite number of such bodies. Thus, what follows is that there must be a moving thing that moves by itself and is ungenerated. But if there is an ungenerated body moving by itself, the universe must be eternal, as is evident to anyone who is even slightly conversant with the sciences. ²³

Fourthly, Aristotle thought that if the world had been generated, it would have potential existence *before* its actual existence in time; this is the nature of all generated things. But this implies that time preceded the generation of the universe. And if time was in existence, so was motion, and if there was motion so too was there a body. Now this body was moving naturally or by compulsion. But if the latter^r, there must have

²⁰ Aristotle, *Physics, VIII:1*, 251b10-252a4. Proclus, *On the Eternity of the Universe*, Proposition 5, contained in Philoponus' *De aeternitate mundi: contra Proclum*, Book 5, 103-04. An English translation is included in *Fragments of the Lost Writings of Proclus*, trans., T. Taylor (London, 1825), 41-44; or in German translation by M. Baltes, *Die Weltentstehung des Platonischen Timaios nach den Antiken Interpreten*, (Leiden, 1978), vol. 2, 139-40.

²¹ Aristotle, *Physics, VIII:7-10*.

²² *Mip'at atzmo; mitzad atzmo*. These expressions correspond to Aristotle's phrase $\bar{\alpha}\lambda\lambda\iota\phi\ \acute{\alpha}\nu\tau\omega\upsilon + \int$ connoting motion of a body that is self-determined, not originating from some other body external to it (Aristotle, *Physics, VIII:4*, 254b 7-33. Wolfson, *Crescas' Critique*, 532, 673-74).

²³ Aristotle, *Physics, VIII:5, Metaphysics, XII:6-7*.

-225-

been natural motion, since compulsory motion is only predicated with reference to natural motion. Now there is no natural motion other than the natural motions that actually exist. But this would mean that the universe existed prior to its generation, which is false. This absurdity derives from the dubious hypothesis that the universe is generated; but since the conclusion is absurd so is the hypothesis. This argument is not explicitly in Aristotle; nevertheless we have extracted it from his words.

Fifthly, Aristotle believed that an absolute generation of motion was impossible.²⁴ For if we were to assume a first generated motion, the movable object involved^s would have to be either generated or ungenerated. If^t it is generated, the postulated first motion would really not be first, since the movement of the generation [of the moved object] would precede it. Now if we were to say that that movement of generation [of the moved object] is the first motion, this motion would also not be the first motion, according to Aristotle, either from the point of view of the agent or from the point of view of the recipient. For if we take the point of view of the agent, Aristotle would say that when the agent acts now and not at some other time, there is some change that came about in the agent^u as a result of which the agent was motivated to perform this act now. Consequently, before the first change [i.e., the first motion there was an antecedent change. Now if we say that the latter change was the prior [change], then by parity of reasoning it too has an antecedent change, and so on *ad infinitum*. And the implication is equally valid whether the first movable was generated or not. [An analogous result obtains if we approach the matter] from the point of view of the recipient of the action. For prior to any case of generation, Aristotle maintains, there is some kind of change. Consequently, the motion, which we claimed^v to be first, is really not first. On the other hand, if it is claimed that that change was the first motion, it is still the case that prior to the generation of that change there was the generation^w of the possibility of change, since potentialities always precede [in time] the actualization of the generated thing. But the generation of the possibility of change is itself a change or follows from a change. Now if the generation of the possibility of change is alleged to be the first [motion], it will turn out for the reason adduced above that it is really not the first motion; for prior to its generation another possibility of change would exist, and so on *ad infinitum*. Suppose, however, that the first movable is ungenerated. But since it is the nature of the mover to move and the movable to be moved, why did [the first movable] move at one time and not move^x at another time? Indeed, there was necessarily some kind of change either in the mover or

²⁴Aristotle, *Physics*, VIII:1.

in the movable or in both. But if this is so, then the postulated first motion was not really the first. Moreover, if that change is alleged to be the first [motion], it would follow that before it there was a change, as it followed in the case of the first, and so on *ad infinitum*. Accordingly, it follows that there is no first generated notion, regardless^y whether the first movable is generated or ungenerated.

Aristotle supported this particular argument by two additional comments. Firstly, since the [alleged first] mover was initially a mover only in potentiality and then actually moved, there had to be a change; for the transition^z from potentiality to actuality is a change. Thus, there is no first motion.²⁵ Secondly, if there were an absolute beginning of motion, a new relation would be generated²⁶ in the first mover, i.e., the relation between the mover and the movable object. But the generation of this relation involves a change too. And so the alleged first change turns out to be not the first. Hence there is no first generated motion. It follows from this that not only is motion eternal but also that there exists an eternal movable object which moves eternally and

continuously in a circular orbit. By a similar argument it can be shown that there will never be a last motion; hence there will always be a body moving eternally in circular motion.

Sixthly, it would seem that from the very nature of prime matter it can be shown that the universe could not have been generated in its entirety. This matter is such that it can never be essentially generated or destroyed. For if it were generated there would have to be a subject from which it was generated. But if it had an [antecedent] subject^{al} from which it is derived, this would be the subject itself, since whatever is in potentiality does not cease being potential. Hence, either the prime matter exists before its generation or it exists in actuality. But both alternatives are false. The same result obtains if [it is claimed that matter can] be destroyed. Consequently, since it is impossible for matter to exist without form, the world is eternal.²⁷

²⁵Maimonides, *Guide*, II:14, Fifth Method. Aristotle, *Physics*, VIII:1, 251a17-251b9.

²⁶Gersonides uses here the term *mithadesh*, "comes about", "generated". It is often a synonym for *hoveh*. It can also connote "created". The latter connotation, however, is incompatible with Aristotle's doctrine and is therefore unsuitable in this context.

²⁷Aristotle, *Physics*, I:9. Maimonides, *Guide*, II:14, 2nd method. By means of this argument the defender of the eternity theory attempts to show that the hypothesis of the absolute generation of first matter postulates, even if unwittingly, another "prime matter" prior to the existence of the alleged first matter. For a generation of a corporeal entity entails the existence of a natural substratum or subject (*nose*), in and from which the generation takes place. According to Aristotle this subject (*τὸ ὑποκείμενον*) is already informed by some form, e.g., copper; however, as the result of some change, this copper subject becomes a bronze subject. The former is potentially bronze; the latter is actually bronze. Of course the latter is potentially copper or something else. To be a material substratum is always to have a potentiality for some specific form; but it is always some form or another. Here Aristotle is talking about substantial change, or generation, which involves matter going from one form to another form [Aristotle, *Physics*, I:7-9; *On Generation and Corruption*, I:3; *Metaphysics*, VII:3, 1028b36-1029a28. See Charlton's Appendix in his edition of *Physics*, I-II and more recently, R. Sorabji, *Matter, Space, and Motion*, (Ithaca, 1988), chap. 1].

Now if the whole universe, including prime matter, were generated, it would, the Aristotelian argues, have to be generated from some antecedent material subject; but then the latter would be the prime matter. Hence, the generation of the basic material substratum generates a destructive dilemma; either prime matter exists before its generation or it exists in actuality bereft of all form, both of which are absurd. Of course, this whole train of reasoning presupposes the basic premise of Greek cosmogony, *ex nihilo nihil fit*.

-227-

Seventhly, since it has been proven that the fifth body [i.e., the heavenly domain] is not composed of contrary elements, it can be proven also that it is not generated. For all generated things are such that they are generated from and are destroyed into their opposites. Now by contraposition it follows that whatever is not generated from or destroyed into its opposite is not generated nor destroyed. But the fifth body does not have a contrary element from which it is generated^{b1} or into which they are destroyed; hence the fifth body is ungenerated and indestructible.²⁸

Eighthly, since it has been just demonstrated that the heavenly bodies are not corruptible because they lack the causes of decay, Aristotle now argues that they are not generated; for he claims that whatever is incorruptible is ungenerated. His proof is as follows. It would seem that it is

impossible for a generated object to be everlasting [*nitzhi*]. For, with respect to a generated thing, the possibility of generation was pre-existent during all of infinite past time. Now if this possibility is assumed to be actualized during any moment in this time, an absurdity follows, i.e., two contrary states would be simultaneously realized: existent and nonexistent.²⁹ Thus, this hypothesis is absurd. Moreover, that which exists for infinite time necessarily has no terminus either in the past or in the future. For if it were finite in one direction, then one infinite would be part of another infinite^{c1}, a result that Aristotle would not countenance.³⁰

A further consideration from another angle supports this contention. If there were a generated but everlasting substance, it would possess the capacities of both existence and non-existence. Now such contrary capacities in one body are necessarily limited; for contrary capacities

²⁸Aristotle, *On the Heavens*, I:2.

²⁹In infinite time all possibilities are realized. Aristotle, *On the Heavens*, I:12.

³⁰The principle that one infinite cannot be larger or smaller than another infinite will play an important role in Gersonides' critique of Aristotle in chapter 27, where Gersonides uses it against Aristotle. Although this principle is implicit in Aristotle (*Physics* 204a 20-26 and *On the Heavens* 275b 12-29), it is explicitly used by Philoponus as a weapon against Aristotle (Philoponus, *De aeternitate mundi contra Proclum*, 11. R. Sorabji, *Time, Creation, and the Continuum*, chapter 14).

-228-

that do not have any intermediate states, such as existence and non-existence (about which we are concerned), as well as contrary actions, cannot occur simultaneously. Hence, such^{d1} capacities are limited. For if they were unlimited, there would be no maximum time to their realization, and hence would be infinite. If this is the case, they would be simultaneous, since one infinite time is the same time as the other infinite time; for there is only one time.³¹ That capacities are limited is alleged to be necessary by Aristotle for all the categories, i.e., their being in a state of potentiality is limited when this potentiality is construed in its proximate and proper place, i.e., the time in which it is actualized.³²

Moreover, [the absurdity of this view, i.e., that a generated substance can endure everlastingly,] is evident from another aspect. It is the nature of the existent thing that necessitates its [being subject to] generation, corruption or non-existence. Accordingly, it is evident that something which by its very nature is non-existent for infinite time cannot become existent for infinite time, unless the nature of the impossible is transformed into the nature of the necessary.

Furthermore, induction shows that all generated things are corruptible and conversely, and in this so in all four kinds of change. Accordingly, by contra-position, it follows that whatever is not corruptible is not generated and that whatever is not generated is not corruptible. Aristotle supported this thesis by appealing to the popular view of his day that contended that the heavens are the abode of God, i.e., they are eternal just as He is.³³

Finally, Aristotle believed that it was impossible for all things to be

³¹Aristotle, *On the Heavens*, I:11-12, especially 281a 28ff.

³²*Ha-koah ha-qarov ha-meyuhad*, i.e., the proximate, specific potentiality. This is the capacity for some particular property or activity that is close to actualization. Maimonides gives the example of the expert scribe who is not writing because, say, he is sleeping or eating. The

remote potentiality (*ha-koah ha-rahoq*) would refer to the generic capacity that all humans have to be scribes (Maimonides, *Treatise On Logic*, XI. See below, chapter 27, n. 2, for a detailed discussion of this notion).

This notion of a proximate, specific capacity in contrast to the remote, generic capacity seems to correspond to Aristotle's distinction between the first potentiality of an agent for some act and the second potentiality for this act. A human being as such has the initial potentiality for learning arithmetic -- the first potentiality (*ἡ πρώτη δύναμις*); if this person acquires this capacity it has become a second potentiality, or first actuality (*ἡ πρώτη ἐντελεχεία*), which can be exercised by the agent if he or she wishes (Aristotle, *On the Soul*, II:1 and 5; *Physics*, III:2-3; *Metaphysics*, IX:6.) Aristotle's first potentiality corresponds to Gersonides' remote power, his second potentiality to Gersonides' proximate power (Philoponus, *De aeternitate mundi*, IV:4, p.65).

³³Aristotle, *On the Heavens*, I:9, 278b 15-16, 279a 29-33.

-229-

subject to generation. For every generated thing is either a body or [a feature] in a body. But if all things are generated after they have not existed, it would follow that body in general would be generated absolutely, i.e. from no body. And it would follow that prior to the generation^{e1} of body there would be a vacuum in which it would be generated; for the place [of a body] is necessarily that which is generated. Also^{f1}, the generation of a body from absolutely no body is impossible. Similarly, the generation of a body from matter that has [only] potential being, i.e., matter without form, [is also impossible]. For it is impossible for matter to be without form; if this were possible, that which cannot be actual will exist. But this is absurd. Hence, it follows that body [in general] cannot be generated.³⁴

Aristotle has discussed these proofs in the *Physics*, *On the Heavens*, and the *Metaphysics*. I believe that he was led to his belief in the eternity of the universe by his theory that God is the mover of the fixed stars and the source of order and perfection in the universe. For, when it is alleged that God is the particular mover of one of the spheres, it is evident that the universe cannot be generated. For it is not proper to say that this heavenly sphere, of which He is the mover, is generated such that at one time God would have a relationship with it, in so far as He moves it and thereby is its perfection [or form] endowing it with life, yet another time He has no relationship with it at all.³⁵ This is obvious to the reader.

Another consideration that led Aristotle to this view was that if God is the source of order and perfection in the world, it would be improper for God to exist without the world. For a concept in the mind that has no corresponding object in the world must, it has been thought, be false, as Averroes has mentioned in his *Epitome on the Soul*. It was this reason, I believe^{g1}, that necessitated Aristotle to hold that the universe is eternal;³⁶ for he was aware that these arguments were not demonstrative, as shall be shown later in our examination of them. Now, Aristotle did not mention these arguments [as proofs], since what he posited concerning these metaphysical matters has no proof; rather, they were [in his eyes] less dubious than the views put forth by other thinkers, as is reported by Alexander according to what Averroes and Maimonides have related.³⁷ Accordingly, these considerations cannot constitute starting-points for a proof establishing the eternity of the universe; for Aristotle did not verify these points but only assumed them as being more probable and worthy of belief.

³⁴Aristotle, *On the Heavens*, III:2, 309 a 1-9. *Physics*, III:6. Averroes, *Tahāfut al-Tahāfut*, First Discussion, page 52.

³⁵Gersonides, Bk. 5, pt. 3, chaps. 11-12.

³⁶Since God is eternally thinking, there must be an object for his concept of the world.

³⁷Maimonides, *Guide*, II:15.

CHAPTER IV

AFTER having mentioned the arguments in favor ^a of the various opinions on this topic, and since it is with the slightest reflection evident to our reader that there is no validity to these arguments whereby the proponents have tried to establish their ^b views, except the arguments of Aristotle -- which is apparent from his criticisms of the other theories -- it is incumbent upon us first to examine the validity of the arguments of Aristotle; for it might be thought that they alone are valid among all the views we have cited. However, because of the complexity of this inquiry a complete explanation [of Aristotle's arguments] in this place is not possible for us until we shall have undertaken a theoretical investigation of the truth on this topic. Then we shall be able to show that our philosophical inquiry agrees with the truth in every respect and is free from any doubt. But it is also requisite that we now answer, at least partially, these arguments; for if we were convinced of their truth it would be difficult for us to envisage any alternative hypothesis, unless it were shown at the outset that in some respect these arguments are not absolutely true on this topic ^c. Accordingly, we have considered it proper to reply, at least partially, to these arguments.

It has been thought that the eternity of the universe follows from the hypothesis that God is the specific mover of one of the heavenly spheres. But this argument is vitiated by our demonstration that God is not one of the movers of the heavenly bodies. ¹Someone might object that from what we have said concerning the First Cause it would follow that the universe is also eternal; for we have proved that God is ^d the agent of all existent things and that He deserves to be called "agent" more than anything else. Accordingly, it would seem that it follows from this that the world is eternal; for it would be quite absurd to assert that an efficient cause is inactive for infinite time. In reply we say that if we were to have a philosophical proof that the universe is generated, this objection would not prevent us from believing in this principle [i.e., an eternal agent has to be eternally active]. For the believer in creation of the universe ²could

¹*The Wars of the Lord*, Bk. 5, pt. 3, chap. 11.

²Here Gersonides uses for the first time in Book 6 (except in the title of Book 6) the expression *hiddush ha-'olam*, which has usually been translated as "creation of the universe" (Pines' translation of Maimonides' *Guide of the Perplexed*, II:15. Other translations have also been used: "the world's production in time", "newness of the world", *Ibid.*, II:13 and 16 [beginning]).

say that the First Cause eternally does the activity that is especially attributable to Him ^e, i.e., self-knowledge. However, the activity that derives from Him by way of beneficence and grace, i.e., the giving of form to existent things in the most perfect way, is not attributable to Him except at the moment of creation. But this act is attributable to the First Cause in so far as He is desired by the moving forms [i.e., the separate movers of the spheres]; and by virtue of their love for the First Cause they desire that there emanate from them activities upon this world in accordance with what their apprehension of the law of the First Cause dictates ^f. In short, if this activity [i.e., creation] were for the perfection of the First Cause, this objection would be

plausible. But it is not for the benefit of God; rather it is an expression of His beneficence and grace, and things of this sort need not be actualized. This solution to this objection will be more evident when we shall have completed our inquiry. Thus, we claim that the thesis that God is the law of existent things does not entail that the existent things exist eternally with Him. For God does not acquire this law from these things, as is the case in human cognition; rather, existent things acquire their being from this law. Hence, it is not impossible that this law exists but the existents which may emanate from it may not exist. For example, if someone invents a tool by himself^g, it can happen that the law of the work exists in his soul^h even if there is no extra-mental subject [i.e., product]. We have explained this in Book 1. Thus, these objections do not entail that the universe is eternal.

Concerning Aristotle's other arguments, which have been thought to confirm truly his view [of eternity of the universe], we shall give here a general discussion so that the truth on this matter will be clear to us; then we shall give a complete reply to them. Now when we examine these various arguments we see that they rest upon an analogy between a total generation [i.e., of the world itself], which is the topic of our inquiry, and the particular generations of things that are generated from nature. But it is evident that it is not appropriate to make analogies between these generations such that we would affirm of the total generation whatever is true of the generation of particular things in the world. For there are features that are necessarily true of the generation of particulars qua particulars, and these features cannot be applied to a total generation, if there is such a kind of generation. You can understand the difference between these kinds of generation by comparing it to the difference between the generation of a whole man and the generation of the nutritive system in him after he has been generated, which is [only] a generation of a part. Now this is the same kind of analogy that obtains

-232-

between total generation [i.e., the generation of the world] with which we are concerned, and the generation of a particular, which concerns the generation of parts within, the universe. Indeed, the world as a whole constitutes one individual; so that many of the earlier philosophers have considered it to be an enormous man, and man to be a small universe.³ Accordingly, the relation between the generation of a part of the universe to the generation of the universe as a whole is similar to the generation of a part of man, e.g., the nutritive system, to the generation of the man as a whole. Now this relation is quite evident when we look at these cases of generation. For just as nutrition is a case of partial generation, whereas the wholeⁱ man remains constant, so too the whole universe is constant while any one of its parts is being generated or destroyed. And just as the generation of the nutritive system presupposes the actual prior existence of that man since he contains the causes of the nutritive system e.g., the nutritive soul, the heart, liver, stomach, and other digestive organs, all of which are inseparable from the other parts of the body (as has been explained in Aristotle's *Parts of Animals*), and hence, the man must exist as a whole prior to the generation of the nutritive system, so too the generation of any part of the universe presupposes the actual existence of the world, since it contains the causes of the generation of this part. For in [a partial] generation an antecedent motion is involved, as has been shown in the *Physics*; and all of these motions ultimately go back to the motion of the heavenly bodies, as is explained in the *Physics*.⁴ And since there is a celestial body [to which generation is ultimately traceable], it follows that all the elements and the compounds derived from them [also] exist, as has been explained in the sciences.

Now that this relationship has been established, we claim that just as in the generation of a whole man, for example, it is not required that this very^j same person exist before this^k generation nor that a part of him exist to which this generation is traceable, similarly it is not required in the generation of the world as a whole, if it is assumed to be generated, that this universe exist

before its generation or that a part exists to which its generation is traceable. Rather, what is required here is the postulation of a separate external mover other than the proximate mover involved in the generation of particulars, just as it is necessary to postulate a separate external mover in the generation of animals and plants, as has been explained in the *Book of Animals* and in Book 5.⁵ And this [agent] is other than the proximate mover responsible for the nutritive operations in that man.

³Maimonides, *Guide*, I:72.

⁴Aristotle, *Physics*, VIII:1.

⁵Aristotle, *Generation of Animals*, II:3. Gersonides, *The Wars of the Lord*, Book 5, Part 3, chap. 3.

-233-

Now someone who affirms of a total generation that which is true of the generation of particular items will have to say with respect to some particular man that he is not generated, just as Aristotle, by virtue of this analogy, says about the universe as a whole. For example, one might say that a particular existent man, e.g., Reuben, is ungenerated precisely because of this analogy between his generation as a whole and the generation of particulars, i.e., the generation of the nutritive system. For if Reuben were alleged to be generated, we would have to say that he existed prior to his own generation. For we find that partial generation [i.e., the nutritive system] requires the prior existence of the nutritive soul and its organs, such as the heart, stomach, and liver, since the nutritive soul cannot function without these organs. Moreover, these organs cannot exist separately from other limbs [of the body], unless they are organs only in an equivocal sense; i.e., if they were separate from the other limbs they wouldn't have the soul-powers that they do possess. Thus, this analogy forces us to maintain that if a man is generated, he exists prior to his generation. It¹ was for this reason that we claimed above] that Reuben would not be generated [if the analogy were allowed]. It is the very same analogy that has led some people to believe that the universe is not generated; for if it were generated, the world would exist prior to its generation. It is evident then that this claim is false. In a like manner many of the arguments of Aristotle for eternity of the universe can be dissipated; for it has been shown that there is a great difference between a total generation and the generation of a part. Accordingly, whatever is true of the latter need not be true of the former. At this point, it is sufficient to realize that Aristotle's arguments for eternity are not demonstrative; later on this will be proved in detail.

Someone might [still] object that our example from these [cases of] generations is somewhat sophisticated. For a man is not generated as a whole unless there exists in actuality previously another man to whom^m his generation is, at least in some sense, traceable. The same is true if the universe is alleged to be generated. Accordingly, Aristotle's claim, that if the universe were generated there would be a moving object to which this creation would be traceable, would be true. But this difficulty can be easily removed. What is true for the generation of this particular man follows from the fact that it is a case of generation of a particular thing within the world. The sameⁿ is true to some extent with respect to the [generation of] the nutritive system, which we have given as an example; for it is not possible for the homonomous parts, of which, e.g., the hand is composed, to be made by the nutritive system if the hand itself does not [already] exist. On the other hand, in so far as this man is generated as this particular man, there is no [antecedent] part of him to which his^o

-234-

generation is traceable. Moreover, the man too from whom the semen comes has no [direct] part to play in the generation of the generated individual such that we would say that the generation is traceable to him. For it is possible for the generated individual to be generated even if the donor of the semen^p has already died. Thus, in this generation what is required is another separate mover [i.e., a separate intellect], as has been explained in the *Book of Animals*.⁶

Maimonides too used something like our principle in rejecting Aristotle's arguments; but he used it in a more general way than we have.⁷ For we have applied it only to the extent that sound reason dictates a difference between the generation of the whole universe and the generation of some one of its parts. Maimonides used it generally to show that none of the features true of the generation of a particular thing is true of generation of a whole. But this is not true in every respect; for it is possible that there are features that are common to the generation of a whole and the generation of a part. You can appreciate the difference between our employment of this principle and Maimonides' use of it^q from what has already been said and from what we shall say in our detailed discussion of the validity of Aristotle's arguments for the eternity of the universe.

⁶Aristotle, *Generation of Animals*, II:3.

⁷Maimonides, *Guide*, II:17.

CHAPTER V

IT is proper to examine whether the universe is eternal or generated before we ask how the universe is generated, e.g., from something or from nothing at all.¹ This is self-evident. And it is also indubitable from the preceding remarks that we ought to investigate which things and properties will enable us to reach the truth on this question before we examine whether the universe is eternal or created.

It is proper to begin this inquiry by examining those things that have been considered to be ungenerated, i.e., the continua,² such as the heavenly bodies and their properties, time, motion, the emergence of the earth³, etc. If we examine these phenomena, they may lead us to the answer to our question. For if it should turn out that these phenomena exhibit a property that entails their being generated, then the whole universe too is indubitably generated. For example, if it can be shown that the heavens are created, it can be easily shown that the entire universe is created, since the generation of the other parts of the universe is traceable to the heavenly bodies, as Aristotle has proved, and we have indicated in Book 5. Similarly, if time or motion turn out to have been created, it will also be true that the universe as a whole is created. For the thesis that the heavenly bodies endure for infinite time without motion and then begin to move is utterly absurd, as is evident to anyone who has already studied this book.⁴ And if we claim it will be proved that the emerged portion of the earth is created -- and hence all generated things on earth in their entirety are created, [i.e.,] those things whose existence

¹*Milo davar*; i.e., *ex nihilo*. For the history of this term see the classic study by Harry Wolfson, "The Meaning of Ex Nihilo in the Church Fathers, Arabic and Hebrew Philosophy, and St. Thomas", reprinted in his *Studies in the History of Philosophy and Religion*, ed., I. Twersky and G. Williams (Cambridge, MA. 1973), vol. 1, 207-21.

²*Medubbaq*, "continuous" (*συνεχής*). Certain magnitudes are continuous in that their parts are so connected and contiguous that nothing else intervenes; e.g., motion and time (Aristotle,

Physics, IV:3, 227a 10-15). Because of their "unbrokenness" they can easily be thought to be "unceasing" or eternal. Hence, if anything is eternal, they would be the paradigmatic cases (Wolfson, *Crescas' Critique of Aristotle*, 617, n.6).

³*Higalot ha-'aretz*, literally "the revealing, or appearing, of the earth". Touati renders this phrase as "*l'émergence de la terre*" (*La Pensée*, 185). In chapter 13 Gersonides will argue that the appearance of dry land, or the inhabited part of the earth, is proof that the world was created. Or, how is dry land possible if it is the nature of water to flow all over a surface? That there is dry land shows that the world has been created.

⁴If the heavens endure for infinite time but motion is created, or finite, then the observed motion of the heavenly bodies had a beginning after an infinite interval of rest. On Aristotelian grounds such a hypothesis is absurd (*Aristotle, Physics*, VIII:1).

-236-

is continuous, and they are the terrestrial species -- then it will be proved that the [whole] universe is created. For if this [whole] thing [i.e., the earthly domain] were created absolutely [i.e., at the beginning of time], the heavenly bodies would exist prior to the generation of these things for a *finite* interval since they are the agents^a of the creation of these terrestrial things, as has been demonstrated previously. If they existed for infinite time before the creation of these things, there would be a natural capacity that would not be actualized except in infinite time, which is absurd. ⁵On the other hand, if we examine these continua and discover that they are not generated, it would obviously follow that the universe itself is eternal. However, if we were to concentrate upon discrete phenomena, i.e., the world of objects that are subject to generation and corruption, in so far as they are generated and corruptible, there would be no benefit in such an inquiry in so far as it would be shown that they are generable; for it would seem that in this respect they differ from those things that are continuous. ⁶Accordingly^b, it is evident that it is proper that we examine the things that are continuous. If it is necessary that these continua are generated, it would follow that the world is generated. But if there is something in them that entails their being not generated, then the universe is eternal. On the other hand, if there is no feature of them that implies either that they are generated or ungenerated, then from this point of view the universe could be either eternal or created.

It will also be shown that it is more appropriate that we begin our inquiry on this question with the phenomena we have [just] mentioned, rather than with God [trying to determine] whether it is necessary that He create the universe or whether the opposite is the case. For our knowledge of the substance, [or essence], of God is quite deficient; hence, it is inappropriate to begin in this manner in a subject about which we want to acquire complete knowledge. Now since it has been shown that the best approach to this subject is to examine the things in the world that are continuous -- and it is evident that our inquiry will be to determine whether or not they are generated^c -- it is obvious that we should first know the features by which a generated object is recognized [and differentiated] from a non-generated object. When we know this and having investigated these continua to see whether or not they exhibit a feature of generated objects as such, it will then be possible for us to

⁵Aristotle, *On the Heavens*, I:12. Gersonides discusses this argument in detail in Bk. 6, pt. 1, chap. 13.

⁶There is no point in studying generable and destructible things to prove that the universe is created; for such things are as such ephemeral, and thus radically different from the heavenly bodies. The latter could then be thought to be eternal.

-237-

establish easily from their very nature whether or not they are generated. We have therefore indicated which existent things should be examined first^d and how we can obtain the truth on this topic.

-238-

CHAPTER VI

THE most distinctive feature of a generated substance is that it is made for some end,¹ unless of course it has been generated by chance; but such things are infrequent. This is evident in all things that are generated in nature or in the crafts; for nature does everything for some end, as has been shown in the natural sciences.² And this is also true in the crafts. But whatever is not generated does not possess a final cause, since it was not [*ex hypothesi*] the act of an agent. This is obvious. For if we were to say of something not made by an agent that it has the particular feature that it has for^a this particular end, this statement^b would be a contradiction. To say that something has a particular feature for a particular end is to admit straight away that there is an agent [who made it for this end]. And since whatever is not the result of an agent has no final cause, a final cause is not assigned to anything in the mathematical sciences, unless there is in them something [exhibiting a goal] by virtue of nature or choice.³ For example, we do not say, for what purpose do the [interior] angles of a triangle equal the sum of two right angles? Or, [for what purpose] is the incommensurability of the diagonal of the square? Similarly with all other mathematical questions. This is the case because there is here no agent who *makes* the angles of the triangle equal two right angles; for this feature of a triangle does not derive from the activity of an agent. Hence, in mathematics we do not specify an agent or final cause. However, the triangle made in the crafts for some goal [e.g., a

¹In this chapter the Hebrew term *takhlit* plays a central role. It corresponds to the Greek *τέλος* and the Arabic *ghāya*. Although these terms can assume a variety of connotations, in this context they express the idea of goal, end or purpose. Aristotle includes the end or purpose as one of his four basic causes. In Latin this type of cause was called "*causa finalis*", from which the English "final cause" was derived. The latter was expressed in medieval philosophical Hebrew as *sibbah takhlitit*. Where the end, or goal, is one involving human action, in which deliberation and choice are factors, it is for Aristotle appropriate to use the term "purpose" or "intention": *προαίρεσις; Kavvanah; qasd*.

²Aristotle, *On the Heavens*, I: 4, 271 a, 34.

³A spherical object can be made for a purpose or have this shape for a purpose. Thus, one can *choose* to make *globular* maps to represent certain geographical features. Moreover, according to Aristotle, some natural objects have the shapes they do have for a purpose. For example, the heavenly bodies are spherical in shape because this shape facilitates their motion (Aristotle, *On the Heavens*, II:4, 8, especially 290b 1 ff). Thus, although in *pure* geometry the sphere and its properties are devoid of any purposive features, in its embodiment in the arts and in nature the sphere does have such features.

-239-

pyramid] can be described as having been made in this shape for some purpose; for in this respect it is the act of an agent. On the other hand, we cannot say, what purpose is served by the fact that its outer angle is equal to its two interior angles; for this latter feature in a triangle is not the act of an agent.

We ought not to lose sight of the fact that something can have a final cause yet be *eternally generated*, even if it is not absolutely generated [at a definite moment], since such a thing would eternally emanate from the activity of its agent. An example of this would be the heavenly spheres which would move eternally with the motions that they have as the result of the conceptions [of their movers]. ⁴Hence, if the heavenly spheres and their movers are uncreated, it is possible for a motion to be derived from them that is not generated absolutely, although that motion [exists] in the best manner possible for the perfection of what was intended through it; for it is eternally created from that conception. And in this sense it is an act of an agent. But it is in this sense only that something without an absolute temporal beginning could be derived from an agent, since it is eternally created from it. On the other hand, if something cannot be eternally created continuously from an agent, it must, if it is in fact derived from an agent, have an absolute generation [i.e., beginning]; for it would not have been derived from an act of an agent unless it were assumed that there was an agent that *created* it. For example, assume that a house has been built by a builder; since it is impossible for this house to emanate eternally from the builder, it follows that it was the builder who created it *after it had not existed* ⁵This is obvious.

[Another] point should also be noted. That we can distinguish in this manner a generated from a non-generated thing does not as such entail that if something lacks some use it is ungenerated; for its generation could be the result of chance. What has been shown is that if something does exhibit final causality, it must be the act of an agent. This is evident. This feature is similar to the procedure of casting nines in arithmetic; i.e., when we cast nines to check whether we have erred in a computation, this casting does not give the correct answer for the number in question; rather it determines whether an error has been made in the computation.

⁴Keep in mind the idea, elaborated earlier in Bk. 5, pt. 3, that the motions of the heavenly spheres are the result of incorporeal movers, or "the separate intellects", which move the heavenly bodies by virtue of their apprehension [tziyyur] of God, the First Intellect. Celestial motion is then the effect of thought (Maimonides, *Guide*, II:4).

⁵Averroes also uses the same example of a house and its builder to illustrate the difference between the relationship obtaining between God and the world and the relationship between any other artisan and his product (Averroes, *Tahāfut al-Tahāfut*, *Third Discussion*, 100).

Analogously, this test does not give a decisive answer that something is uncreated but only that something is created if there is something in it that entails ^c final causality. ⁶This is clear. Accordingly, this rule can be used only for determining whether something is generated, not whether something is ungenerated.

Another characteristic by which generated things can be distinguished from ungenerated things is that the former manifest properties that do not necessarily follow from their natures or essences, as in objects that are generated in the crafts. A piece of wood, for example, can be a chair or a box, neither of which shapes is essential to the wood as such. But ungenerated things cannot manifest such non-essential features precisely because they are ungenerated. For if they were to possess a non-essential property they would possess it by accident, since *ex hypothesi* it does not derive from the nature of the substance. Nor is there another agent that generates this property in the substance; for this is something that cannot obtain in an eternal substance. Nor can this property inhere eternally in them; for what is accidental occurs infrequently. Moreover, it would be difficult to posit something as that which necessitates the occurrence of this [accidental] property with this essence, whose nature does not necessitate this property; for this is an impossible assumption, unless it is assumed that there exists one ^d agent that causes these

things to be united and connected with each other. This is not only self-evident but is admitted by Aristotle as well, who says something ^e like this principle in his scientific and metaphysical writings. ⁷

A [third] feature by means of which generated things can be distinguished from ungenerated things is that in the former there can be some-

⁶The method of "casting nines" is a procedure used to check if an addition or multiplication is correct. It was known to Indian and Arab mathematicians, but was probably Greek in origin [C.B. Boyer, *A History of Mathematics*, (New York, 1968), 241]. This procedure will show if an error has been made; it does not, however, indicate that the answer is necessarily correct. It is based upon the principle "that, if each number in the question be replaced by the remainder when it is divided by 9, and if these remainders be added or multiplied as directed in the question, then this result when divided by nine will leave the same remainder as the answer whose correctness it is desired to test when divided by nine: if the remainders differ, there is an error" [W.W. Rouse Ball, *A Short Account of the History of Mathematics*, (New York, 1960), 160].

Gersonides' analogy between this arithmetical procedure and his cosmological principle is this: just as the former can tell us that we have made an error in our computation but not by itself give us the correct answer (as would a calculator), so too Gersonides' principle tells us that a certain thing is "the act of an agent", or created *if* it exhibits a purpose; but it does not show that something is not created because it doesn't exhibit a purpose. Both the method of casting nines and Gersonides' principle then are not "decisive decision procedures".

⁷Aristotle, *Metaphysics*, XII:10, 1076a 1 ff; *Physics*, VIII:6, 259a 12.

-241-

thing in its essence which is for the sake of something else. This is evident in nature as well as in [things generated] by choice and will, i.e., the crafts. In nature, for example, we see that plants exist for the nourishment of animals; in the crafts, a piece of clothing exists for the protection of man against the surrounding ^f cold. However, it is impossible for something that is not generated to have a feature in its essence that is for the sake of something else. This is quite ^g evident. For it cannot have a final cause at all, as has been explained; all the more so, it is not proper that there be anything of final causality in it for the advantage of something else. This point can be understood in the following way. Something that exists for the sake of something else is united and intimately connected with the latter object. Now an eternal essence is united with another essence only if there is an agent that supervises both of them and connects these things and arranges them one for the other. This is self-evident to those who are familiar with this book.

-242-

CHAPTER VII

After having explained (as best we can) the conditions that distinguish generated from non-generated objects, let us now see if those things that are continuous exhibit these features. First we shall examine the heavenly bodies, for they are the causes of the continuity of all the other continua, such as time, motion, etc.

Now it is quite evident from what we have established previously ¹ that everything in the substance of the heavenly domain is of the maximum perfection possible for the perfection of

these existents [i.e., sublunar phenomena], such that if any irregularity in the order of the heavens were to occur, these existents would be destroyed. For example, the distance between the heavenly domain and the earth is absolutely perfect in order that the activity necessary for the perfection of earthly phenomena emanate [from the heavenly bodies]; for it has been proved that a change in the distance entails a change in the activity that stems from it. And it can be shown that the size of a heavenly body is such that whatever is necessary for the earthly sphere emanates from it; if it were larger or smaller than it is, the order on earth would perish. Similarly, it has been shown that the figure of the spheres of the heavenly body -- such that some of them are in non-parallel planes ² and the distance of the centers ^a of their planes is [precisely] that distance which obtains between ^b them, according to what has been demonstrated -- is also the most perfect possible for the perfection of the sub-lunar world, because of what is generated from this [state of affairs] when a heavenly body is close to the earth and when it is distant from the earth ^c; and because of what is generated therefrom by virtue of the differences in motion for a heavenly body, such that at one time its motion is faster and at another time slower. Similarly, it has been shown that the very order of the spheres of a heavenly body is also directed for the most perfection possible [for the earthly domain]; so that activities emanate from the heavenly body

¹Gersonides, *The Wars of the Lord*, Bk. 5, pt. 2, chap. 3.

²The term *bilti nekhohi ha-shetahim* would appear to signify here "non-parallel planes", although it can assume other connotations (see Klatzkin under *nekhohi and shetah*). In this passage Gersonides envisions a situation where two spheres, or surfaces, are spatially related to each other such that one is inclined towards the other, creating an angular distance between them that has, on his teleological view of the universe, favorable consequences for the terrestrial domain. (I am grateful for the help given me on this passage by Rabbi N. L. Rabinovitch of *Yeshivah Birkat Moshe-Ma'aleh 'Adumim*).

which this [sub-lunar] existence requires to be emanated. If their order were otherwise, the compound motion which the heavenly bodies have would not be generated from them, without which there would not emanate from them what is necessary for the perfection of terrestrial phenomena.

Furthermore, it has been demonstrated that the differences in radiation exhibited by the stars are also of maximal perfection so that the different activities required for the perfection of sub-lunar phenomena emanate from them. For example, the radiation of the sun is different from the radiation of the moon, such that from the former emanates heat and from the latter moisture. It is for this reason that the colors of these radiations are also different, as has been previously [shown]. Similarly, it has been demonstrated that the place of the heavenly body in its sphere is maximally perfect, such that there emanates to the sub-lunar domain whatever is needed to emanate from the heavenly body. If the body were a bit more to the north or to the south, there would not emanate from it what is necessary for these (sub-lunar] things, as has been previously explained. ³ Similarly ^d, it has been demonstrated that the position of the poles of a heavenly sphere is the most perfect possible, such that if the inclination is either greater or less than it really is, that which emanates from it [and is required] for the perfection of the earthly domain would be different, as has been explained. Analogously, the [exact] number of the spheres of a heavenly body is optimally perfect such that the compound motion of [each] heavenly body, without which the required influence deriving from it upon the earthly domain would not be achieved, is thereby realized. Again, the many stars in the uppermost sphere and their particular arrangements are also optimally perfect for the perfection of the sub-lunar domain; for from

these stars many different activities are generated by virtue of which the many terrestrial phenomena are perfected. Similarly, that some heavenly bodies emit light, whereas others merely reflect light from other bodies is also of maximal perfection for the perfection of the earthly domain. In the case of the moon -- some of whose parts receive light whereas other parts do not - - this fact too is of the maximum perfection for the perfection of the earth. Similarly, the existence and the location of the Milky Way within the sphere of the fixed stars is also of optimal perfection for the perfection of the earthly domain. Moreover, the [exact] quantity of the body that doesn't keep its shape which is between the spheres of one heavenly body and the spheres of another heavenly body also exhibits maximum wisdom. [It is the right amount] so that the motions of the heaven-

³Gersonides, *The Wars of the Lord*, Bk. 5, pt. 2, chap. 9.

-244-

ly bodies are not mixed up [and] their influence upon the earth is accomplished. Indeed, even the number of spheres as a whole and [their] stars is maximally perfect; so that from their entirety^e sub-lunar existents achieve the most perfection possible by virtue of the activities that particularize each heavenly body and from the proportions that result from the mixtures of their radiations. For in this [way] the law, order, and rightness of terrestrial existents will be achieved in the most perfect manner.

In the light of all these facts, and since it has already been demonstrated that whatever exhibits final causality is the act of an agent, it is evident that the heavenly bodies and their properties are all the act of an agent. Aristotle was on the right track, therefore, when he says in Book 2 of *The Physics* (chapter on chance and spontaneity) that those who claim that the heavenly bodies are spontaneous phenomena are farther from the truth than those who say this about plants and animals. For, according to Aristotle, chance and spontaneity cannot occur in the heavenly domain.⁴ Amongst earthly things, however, many properties can be attributed to chance, i.e., those accidental features that do not derive from their specific natures. This is the meaning of Aristotle in this context, although he does not use this particular mode of expression.

Accordingly, since it is evident that when something has this sort of independent existence, [or stability],⁵ it is necessarily generated; i.e.,

⁴Aristotle, *Physics*, II:4. Aristotle distinguishes between chance, or luck (τυχή) and spontaneity (+03C5τU=00F3ζατον). The latter term is literally rendered in □(τὸ Gersonides' Hebrew as *me'atzmutam*, "from themselves". In *Physics*, II, 196a 25 Aristotle refers to some philosophers (perhaps Democritus) who claim that the whole heavenly domain arose "by itself", "automatically" (Charlton's translation). For Aristotle such a view is absurd. In *Physics*, II:6, Aristotle defines chance, or luck, as involving thought, and hence belonging to humans, whereas spontaneity, or the automatic, can occur in the non-rational domain. e.g. a horse "automatically" ran out of the barn when it saw the flames; according to Aristotle, this behavior was "spontaneous" because although the horse's exiting from the barn saved it, it did not run out *in order to be saved* (*Physics* II:6, 197b 14-18).

⁵*Qiyyum be'atzmo*. This term corresponds to the Greek αὐθυπόσατον, a favorite term of Proclus and other neo-Platonists. Jonathan Barnes renders the Greek as "self-constituted" (J. Barnes, "Immaterial Causes", *Oxford Studies in Ancient Philosophy* I (1983), 178-79). The standard English Greek lexicons translate it as "self-subsistent" (Lampe) or "self-substantial" (Liddell-Scott). The Arabic equivalent is *qiwām bidhātihī*, which Genequand translates as

"subsisting by itself" (Genequand, *Ibn Rushd's Metaphysics*, p. 70). In Rabbinic Hebrew the term *qiyyum* connotes permanence, stability.

A good English equivalent for this term in this context is not easily found. Gersonides wants to distinguish here between things whose existence is more basic, or substantial, from those whose existence is less basic. Later in this chapter he will give motion as an example of the less substantial items. As his comments indicate, what makes a thing more or less substantial is not necessarily its duration, since the motion of the heavenly bodies is everlasting, i.e. infinite in duration at least in the future. Of greater relevance is the notion of independent existence, such that a thing having qiyyum would ordinarily be a substance, as distinct from an accident, or an essential property of a thing rather than an adventitious feature of it. Planets or plants then have qiyyum; their movements or colors do not. In the Guide, I:69 Maimonides says that God is the cause of the existence and qiyyum of all the forms in the universe. In his translation of the Guide, Pines' renders qiyyum as "stability" or "constituted". Touati translates Gersonides' qiyyum as "stabilité" (La Pensée, 179).

-245-

when it is assumed to be the product of an agent, it is clearly the case that the heavens are generated. Indeed, that it is necessarily true of an independently existing thing that it is generated *absolutely* when it is assumed to be the act of an agent will be apparent from the following. Now it is possible for something to be the agent of another thing in such a way that either the latter emanates continually [i.e., eternally] from the former -for example, it is said that from the heavenly bodies' conceptions of the order of the sub-lunar world there emanates continually whatever derives from the motions of these bodies -- or something could emanate [from its agent] only at the moment of its generation [i.e., absolutely].⁶ However, it is obvious that we cannot maintain with respect to the heavenly bodies and their aforementioned attributes, which are of the maximum perfection such that what is [needed for] the perfection of the terrestrial domain is thereby^f achieved, that they emanate continually from God. For this hypothesis leads to many unavoidable absurdities. Firstly, something^g would be generated from nothing and destroyed into nothing. Secondly, time would be composed of instants. Thirdly, the heavenly bodies would exist only potentially. Fourthly, there would be no unitary, continuous motion, indeed there would be no motion at all in the heavenly bodies; nor would there be differences in the velocities of their movements. In short, to list the absurdities inherent in this hypothesis requires a long essay. Therefore, we shall be brief but provide [enough argument] sufficient for the refutation of this hypothesis. That these kinds of absurdities follow from this hypothesis I shall now demonstrate.

If the heavenly spheres and all the properties of them that we have discussed were assumed to emanate eternally from God, it would follow that they would pass into nothing as soon as they emanate from Him and then emanate again from Him from nothing. For if it is assumed that from the spheres existing now God makes the spheres that exist after this moment, there would actually be no production at all, since they would be always in the same condition. In general, that which is generated from something is generated from something that differs from it, not from something like it in all respects. For example, *viridis* [copper dioxide] is generated^h from a piece of copper; but a piece of copperⁱ is not generated out of another piece of copper that is like the former in all respects.⁷

⁶Maimonides, *Guide*, II:12.

⁷The point here is that the product must differ from the materials in some significant respect; otherwise there would be no principle of individuation. Now with respect to the heavens,

Aristotle maintained that they are all of the same stuff, i.e., the quintessence. Accordingly, if *ex hypothesi* they were created at one moment out of the heavens existing at a preceding moment, they would not be significantly different from the latter.

-246-

Consequently, if it is assumed that the spheres and their properties are continually emanating from God, as the light emanates continually from the sun, they would be continually emanating from nothing and be destroyed into nothing. But this is utterly absurd.

Secondly, from this hypothesis it would also follow that they are generated and destroyed in one and the same moment. For if the heavens are generated at one moment, then destroyed in the next moment, and then recreated at a third moment, the existence of the heavenly bodies would not be continuous. Indeed, the time of its existence would be equal to the time of its non-existence, and this is absurd. In addition, they would not *continually* emanate from God, as was originally claimed. On the other hand, if it is alleged that they perish in the same instant in which they are generated, it would follow that in one and the same moment they are generated and destroyed, which is also absurd; i.e., that contraries can co-exist¹.

Thirdly, it would follow from this that the heavens would be re-created at every moment since they emanate eternally from God. But from this it follows that each instant is continuous with another instant, and hence time would be composed of instants. For if there were a temporal interval between the instants in which this generation takes place, the existence of the heavens would not emanate from God during that interval. But it was assumed that the existence of the heavens continually emanates from God. We have here, then, an impossible contradiction. Consequently, on this hypothesis an instant would be continuous with another instant, [i.e., time would then be composed of instants, which is false].⁸

Fourthly, this hypothesis also implies that the heavens exist only potentially. Since on this hypothesis the heavens exist only for one

⁸For Aristotle time is a continuous magnitude, i.e., each segment of time is so "close" to the segments that precede and succeed it that they are "one"; the boundaries, or limits, of each segment merge (Aristotle, *Physics*, V:3, 227a 10-15). But the now, or the instant (*'atah*) is not really a segment, or part of time, since one instant is not next to another, no more than one point is next to another point. Instants and points are discrete, not continuous, entities (Ibid, IV:10, 218a 7-20; IV.11, 220a 13-25). Thus, time cannot be composed of instants.

Assuming the Aristotelian theory of time Gersonides argues that on the doctrine of eternal emanation the heavenly bodies would be re-created at each instant and hence could enjoy *continuous* duration, which is our original hypothesis, only if time would be composed of instants. But the latter is false!

-247-

moment, and it is evident that things that exist in this way exist only potentially, as Aristotle proved in the *Physics*,⁹ the heavenly bodies would then have only potential existence. From this it follows that there would be no continuous motion amongst the heavenly bodies, since continuous motion requires the [continuous] existence of one moveable object, as has been shown in the *Physics*.¹⁰ But on this hypothesis there is no one continuous body. Indeed, it would also follow that there is no motion [at all], since the heavenly bodies would exist only for an

instant, and there is no motion in an instant. And if there is no motion in the case of one of the heavenly bodies, then it is not possible for motion to result from all of them together; for motion accrues to all of them together as the result of multiplying the motions of the individual bodies while each exists. From this it can be shown that there are no differences in velocity. In this manner it can be shown that this hypothesis entails many other falsehoods, from which no escape is possible. Consequently, it is obvious that we cannot posit the existence of the spheres and their bodies as emanating eternally from God. In general, this kind of emanation could occur only among accidents that have no subsistence [or stability], such as motion and the like^k; but with respect to things [e.g., substances] that have stability, this kind of emanation cannot occur at all.¹¹ Now that we are convinced that the spheres do not eternally emanate from God, and having already shown that the heavens are made by an agent, it is necessarily the case that they emanate from their agent at the moment of their generation [i.e., absolutely]. This entails that the heavens are created.

Now someone may object and say that the subsistence [or stability] of the heavens continuously emanates from God in the same way as the subsistence of matter in natural substances continuously emanates from the form, as has been demonstrated in the natural sciences; hence, the absurdities previously cited would be avoided. We reply as follows. The cause of the subsistence of the heavens may be explained in this way; but the efficient cause of their [very] existence cannot so be explained. And the above-mentioned proof shows that their [very] existence derives

¹⁰Aristotle, *Physics*, VIII:8-10.

¹¹As already indicated in note 5, the term *qiyyum* connotes here the independent, stable existence of a thing. Motion, however, is literally a "transitory" feature of a body. Even when the motion is everlasting, it is still less substantial than the body that moves. And of course some things (the Separate Intelligences) never move; indeed, such things have more substance than the things that do move. Gersonides' point here is that although it is not intrinsically objectionable for a lesser substantial thing (e.g. motion) to emanate continuously from God, a thing having independent existence or stability could not; for, if it did so emanate it would be continually coming into and passing out of existence. And of course this is not a thing having independent, or stable, existence!

⁹Aristotle, *Physics*, IV:13.

from the activity of an agent. Now, since it cannot be maintained that they emanate continuously from God, they must emanate from Him at the moment of their generation, as we have explained.

Moreover, this type of emanation of the subsistence of matter from the form obtains only in things that are composites from contrary qualities. For example, the natural heat of a body preserves the moisture¹ [in the body] and sustains that body in the form that it possesses as long as it is possible for the active powers [in the body] to dominate the passive powers.¹² But the heavenly bodies do not require this [kind of conservation], for they are not composites nor do they possess a nature that entails their destruction. Hence, it is impossible to claim that their subsistence continually emanates from God.

It has therefore been demonstrated that the heavens have been created from one cause that has made them in the way that they are, since^m [this] way is for the purpose of benefiting sub-lunar phenomena in the most optimal manner. It would be impossible to claim that their shapes and

other properties are merely accidental, since they are the most perfect possible for what has been intended through their activities, as can be indubitably seen. Moreover, it would also be impossible to say that their shapes and other properties belong to them by accident without any agent [that produced them], but that their activities are assigned to them by such an agent. For if this were the case, then their activities would have the [particular] features [they have] because it would happen by chance that they have the [particular] shapes that they have. But this is contrary to what is observed; since the shape of a natural substance is for the sake of the activity it performs, and not conversely. Aristotle has proven this principle in his treatise *Book of Animals*.¹³ For example, we should not say that the eye sees because it has the shape and composition that it in fact possesses; rather, we should say that it has this particular shape and composition so that it sees. And it is equally true that the heavenly bodies have the shapes and properties they have for the sake of the activities which derive from them, which cannot be accomplished except in this manner. Moreover, how is it that the shapes and other properties of these bodies are [so] intelligently¹⁴ [ordered]; what purpose do they have unless their existence is derived from an Intellectⁿ? Would that I knew! Again, how can it be maintained that it is by mere

¹²Aristotle, *On Generation and Corruption*, II:2, 329b 25ff; *Meteorologica*, IV:1.

¹³Aristotle, *Parts of Animals*, I:1.

¹⁴Touati emends the text here on the basis of Paris manuscripts 721 and 722. Instead of *muskalim* he reads *maskilim*. Thus, he paraphrases this sentence as: "How is the fact to be explained that the heavens are endowed with an intellect...if they do not themselves emanate from an Intellect?" (my translation. *La Pensée*, 176).

chance that these spheres and bodies agree with each other such that from the shape of one body there is accomplished what the shape of another body lacks in perfection^o to accomplish? This would be absurd! All this can be explained, however, if we say that one cause produced these spheres with their various bodies, sizes, quality of illumination, shape, and number of auxiliary spheres, so that whatever is necessary for the intended perfection of the earthly domain is achieved in the best manner possible. And when we admit that this fact, [i.e., their perfection] derives from an efficient cause, as is obvious from their perfection, it is evident from what has preceded that the heavenly bodies have been created.

In short, if it is reprehensible to claim that sub-lunar phenomena, such as plants and animals, are not^p derived from an efficient cause [but from chance], it is even more reprehensible to say this about the heavenly bodies. For, since we infer that something is derived from an efficient cause from the good and final causality it exhibits, that which exhibits even greater good and final causality ought more to be regarded as deriving from an efficient cause. Indeed, it is quite possible that something can exhibit some good and purposiveness even though it has not been produced by a cause. For example, a stone may fall and accidentally shatter in such a way that a part of it can be used for sitting.¹⁵ Accordingly, since it is evident that the heavenly bodies possess such a high level of good and final causality that there is no element of chance in them -- as do natural things on earth that exhibit many features that have no use (these are the accidental properties true of individuals qua individuals) -- and that this goodness^q does not inhere in them [just] occasionally, as it does in things that are subject to decay, it is clear that the thesis that the heavens are not derived from an efficient cause is more absurd^r than the thesis that claims that animals, plants, etc. are not from such a cause. Thus, Aristotle agreed that the heavenly bodies are derived from an efficient cause; ¹⁶it was as if the truth forced him to this conclusion. Now, it has been demonstrated that if the heavens are derived from a cause, it follows that they are created, and this proof is free from doubt. Indeed, the number of proofs establishing this thesis

corresponds to the number of properties found in the very essence^s of the heavenly bodies; for they exhibit no feature that does not have some obvious use, as has been explained. This proof is especially noteworthy because it is based upon premises that are all self-evident.

¹⁵Aristotle, *Physics*, II:6, 197b 17-18, where Aristotle gives the example of a tripod that falls in such a way that it can be used for sitting.

¹⁶Aristotle, *Physics*, II:6, 198a10 (Touati , *La Pensée*, 176n.8).

-250-

I believe that it is precisely because of the obviousness of what we have demonstrated that some of the recent followers of Aristotle were forced to admit that God particularized the nature of the heavens and arranged them in the way that they are, as if they wanted to combine contrary properties, as Maimonides relates. This thesis [actually] commits them to the view that the heavens are created; yet they believed that they were not generated. ¹⁷

Now once it has been established that the heavens are created, it can easily be shown that the universe [*in toto*] is created. For if there are no heavens, there is no up or down; and if there is no up or down, there are no elements. And if there are no elements, there are no compounds. In short, since the heavenly bodies are in some sense efficient causes of sub-lunar phenomena, and since it is obvious that if the cause is absent so is what is attached to and follows from it, it is evident that when the heavens have been shown to be created, so has the universe in its entirety.

¹⁷Maimonides, *Guide*, II:21. Here Gersonides alludes to a commonly used medieval argument for creation -- the particularization argument [H. Davidson, *Proofs for Eternity, Creation, and the Existence of God in Medieval Islamic and Jewish Philosophy*, (Oxford, 1987), chap. 6]. In brief, the argument attempts to infer creation from the *particular features* of the universe; e.g., the reddish color of Mars, but the whitish color of Venus. Gersonides will make heavy use of this argument in chapter 8.

-251-

CHAPTER VIII

IT is appropriate to examine at this point a problem that is common to both the creation and the eternity hypotheses before we complete our investigation into the other features from which we could derive a proof for either the eternity or the creation of the world. This problem derives from the fact that there are properties in the heavenly bodies that do not stem from the nature of the heavenly bodies. For, if we assume that these bodies are created, it seems that it would follow, for example, that there would not be in them a variety of forms belonging to one matter; [for] in other things generated from natural substances [i.e., elements], we find that to one specific subject [i.e., matter] there is a specific form and that the diverse forms in them belong to different subjects. But if we assume that the heavenly bodies are not created, this consequence is even more obvious; for it is inconceivable that there should be in an ungenerated thing anything except what follows from its nature and essence. That there exist in the heavenly bodies many features that do not follow from their nature and essence^a is evident; for it has been established in the natural sciences that the nature of the heavenly bodies is one, uniform, simple and homomerous, since its nature is neither light nor heavy. ¹

Having established this I now ^b argue that there are *many* features of the heavenly bodies that do not follow from the nature of such bodies. No matter how one interprets the character of the movers of the heavenly bodies that serve as the forms of these bodies, such movers are different in species. If we conceive of them in the manner explained in Book 5, it is evident that they do differ in species. And if they are conceived in the manner of a series of causes and effects, as some of the interpreters of Aristotle have done, they would also be clearly different in species. In general, we come to know the form from the activities that derive from this form. Since it is clear that different activities derive from these movers, as has been established from the emanations from each one of the heavenly bodies, it is evident that these movers are different [in species]. Accordingly, since these movers, which are the forms of the spheres, are different and it is evident that the nature of the heavenly bodies is uniform, it is clear that the nature ^c of these spheres is not

¹All the heavenly bodies have, according to Aristotle, the same physical constitution. they all consist of the fifth element, the *aether*, whose nature it is not to be heavy or light (Aristotle, *On the Heavens*, I:1-3).

-252-

responsible for the diversity of forms [i.e., movers]. Hence, it is evident that the different forms found in the spheres do not come from the nature of the spheres [themselves].

Moreover, I claim that the diversity in quantity amongst the spheres cannot be attributed to their nature. It seems that [in general] the quantity of a natural body is determined by its nature. For example, you do not find an ant that is the size of a camel, nor conversely. Yet within each sub-lunar species the individuals can vary in quantity, since in so far as they are composed of contrary elements their matter is necessarily subject to latitude in quantity and quality. ² Accordingly, the mixtures in the individuals of a given species do vary to some extent by virtue of their individual natures. Hence some individuals [of a species] are larger than others because the mixture in some of them has more receptivity ^d for growth than the mixture in the others. But since the heavenly bodies do not have any mixtures such that there could be a difference in mixture between one sphere and another, it is evident that their nature cannot account for their difference in quantity. For they do not possess [accidental] properties because of their individual natures, since they do not exhibit any features by accident, as do terrestrial phenomena. ³

That it is necessary for the matters of sub-lunar phenomena to have latitude in quantity and quality because they are composed of contrary [elements] -- which we have assumed in this context -- will be evident from the following. If the matter of a given species were not to have [a definite] latitude, an infinite number of species would result. For from the mixture of the nature of the elements an infinite number of proportions of composition and blending are generated. And if to each mixture there were a distinct form, an infinite number of species would result. But the number of species must be finite, since their essences are objects of knowledge for God and the Agent Intellect, and whatever is not numerically bounded is not knowable. Hence, the number of species is finite. This implies that the matter of a given species has [a definite] latitude in quality such that the different individuals ^e within a given species have, to some extent, different internal mixtures. Moreover, since the matter of the individual members of the species is continually receptive to qualitative change -- whether from the surrounding air or some other such external thing, or from some other kind of cause, such as its nutrients, etc. -- if it did not have [a definite] latitude in its qualitative [diversity, the individual member of the species] would not be able to last except for a short time only. For it would depart from its particular inter-

²By latitude (*rohav*) Gersonides means a range of variation, or diversity, having definite bounds (Ephodi and Abravanel on Maimonides, *Guide*, II:19, 39b-49a).

³Maimonides, *Guide*, II:19.

-253-

nal constitution immediately after it was generated, and consequently death would inevitably ensue. For this very reason there must be [some] latitude in quantity. Since diminution^f results from some external cause whereas growth results from nutrition, it is impossible for an individual member [of a given species] to remain at all in one [definite] size.⁴ If the quantity of the members of a species were fixed, admitting no variations at all, any quantitative change [in the organism] would inevitably be followed by death. Moreover, it is impossible for generation of individuals in terrestrial species to take place unless their matter has some latitude in quantity. For in the beginning of their generation it is not possible for them to have the full size that individuals of that species [normally] attain. For example, it is impossible for an embryo to be the exact same size as its parent; the same is true for plants that reproduce by seeds. This is quite obvious. [Finally,] it is evident that the differences in size found amongst the individual members of a species results from their qualitative differences, e.g., the mixture of this organism is better suited for growth and increase in bodily size than the mixture of another individual.

Now, since it is evident that it is impossible for the heavenly bodies to exhibit qualitative diversity because they lack the qualitative features [of dryness, moisture, heat, and cold], it is even clearer that their nature does not account for the fact that some of these bodies encompass others; for bodies of such a sort are bodies of different natures, as in the case of the elements. For in the latter case, the nature of the encompassed element [i.e., air] differs from that of the element which encompasses^g [i.e., fire]. Indeed, from the nature [alone] of the heavenly bodies there should be only^h one heavenly body, as is the case with each nature of the four elements, [i.e., there is only one element fire, one element water, etc.].

Furthermore, it is evident that the nature of the heavenly bodies cannot account for the fact that they are not arranged in parallel planes, such that one sphere is thicker on one side than on another.⁵ For, from their uniform nature one would have expected that each sphere would be alike at each of its sides.ⁱ

Moreover, the parts of the sphere are all of the same nature. Hence, this nature cannot explain why one part of the sphere differs from the other parts; e.g., one part emits light and is not transparent -- planet or

⁴External and internal causes of decrease or increase in size are ubiquitous. Hence, diminution or growth is inevitable. The organism must, therefore, be capable of some degree of variation in size.

⁵If spheres are nested in each other concentrically or in parallel planes, the circumference of one is equidistant at *all* points from the circumference of another.

-254-

star -- whereas the other parts of the sphere are transparent and do not emit light. A body composed of contrary elements can exhibit this kind of diversity in its parts because it is composed of contrary elements; hence, such a body can have diverse parts. For example, the nature of the liver in an animal differs from the nature of the brain in that animal. But in the

heavenly bodies one doesn't find such diversity in their parts since they consist of the same nature, as has been explained. Accordingly, it is clear that the nature of the heavenly domain does not account for the fact that the heavenly spheres have the planets or stars that they do have.

In an analogous manner it can be shown that since all the heavenly bodies are of the same nature, this nature cannot explain their observed differences in size.

Similarly, it can be demonstrated that since the heavenly bodies have the same nature, their nature cannot account for the differences in color in the light of their rays; e.g., some of them emit a red illumination, whereas others emit a white or another color of light, as is evident from the facts of the matter. Now a difference [in the color of illumination] is easily explicable in the case of terrestrial bodies because of their differences with respect to heat, cold, moisture, and dryness, as has been pointed out in the natural sciences. But since the heavenly bodies exhibit no [internal] diversity at all by virtue of their uniform nature, this nature cannot account for the differences in the colors [of their illumination]. Analogously, since they have this uniform nature, this nature cannot explain the fact that from one ray there emanates something different from what emanates from another ray. For example, the nature of the heavenly bodies cannot explain the well-known fact that the sun heats and dries terrestrial phenomena with a tempered dryness, whereas the moon cools and moistens.

Similarly, it is evident that since all the heavenly bodies have the same nature, this nature cannot explain why some of them emit light whereas others only reflect light from other heavenly bodies, as we see in the case of the sun and the moon respectively. Moreover, since this nature is uniform, its nature cannot explain why one part of a heavenly body should be different from another part such that the moon, for example, receives light at one of its parts but not at other parts. This is obvious from the shadows that are observed on it, as we have explained in Book 5. Furthermore, since the heavenly domain is of one nature, its nature cannot explain why some spheres have many bodies whereas others have only one or none. Finally, since these bodies have a uniform nature, this nature does not explain the fact that some parts of the heavenly domain preserve their shape whereas others do not. ⁶Such a diversity one would

⁶*The Wars of the Lord*, Bk. 5, pt. 2, chap. 2.

expect in terrestrial bodies because of their differences in density and rarity, which stem from their differences with respect to heat and cold, dryness and moisture. But this [kind of explanation] is impossible for the heavenly bodies, since their nature is uniform.

Accordingly, since it is evident that if the heavenly domain were eternal there would not be present these features that do not stem from the nature of the heavenly bodies, and since it also seems that if the heavenly bodies are generated there shouldn't be these features that do not derive from their nature^j -- for in cases of natural generation on earth the features they have stem from their natures -- how do we resolve this issue? Would that I knew!

Now, it was clearly demonstrated in the last chapter that the heavens are created; but it was not proved that their creation was like that of natural generation on earth. Now it was from^k this latter point that this problem arose. But perhaps it is in this respect that the generation of a whole differs^l from the generation of a part; for between these two kinds of generation there necessarily is a striking difference, as has been explained. Thus, it is not impossible that this generation [i.e., of the universe] is such that it is not like the generation of a part [or particular

item in the universe]. We see something similar in the crafts. A craftsman can endow one [and the same] matter with many different forms with which this particular craft can normally accomplish. A silversmith, for example, can make from a given piece of silver a goblet, a ring, a bracelet or any such thing that he *wants* and that can be made from silver. Accordingly, the generation of the heavens is also a case of generation whose cause is will and choice, as in the crafts. But, whereas the crafts give only the shapes because they are in some sense external to the thing made, God gives the whole nature of the thing, as is the case with the activities of the other separate intellects. It is proper for the activity of God to be more marvelous and exalted than the activity of the agents that are derived from Him, just as His level [of perfection] is infinitely greater than their level. And since their activity is limited and ordered [by God], they are not able to change that order, just as it is with subordinate political officers who are under the head of state; whereas the activity of God expresses whatever He decrees, as is the case with the head of a state who orders the affairs of state as he wishes. Thus, the proof demonstrated earlier that the heavens are created shows that they were created *voluntarily*, not according to the manner of natural generation. How this kind of creation can be attributed to God without giving rise to any difficulty will be discussed after we have completed our inquiry on this whole topic of creation and eternity of the world.

It has therefore been demonstrated that generation whose principle [or cause] is will and choice is prior to generation by nature. This is

-256-

indeed proper. For just as voluntary motion^m is prior to the other kinds of motion, as has been explained in the *Physics*, ⁷so too the generation that occurs from choice is prior to generation by means of natural processes. However, whether or not it is required that there be motion prior to [voluntary] generation is a question that we shall discuss after our inquiry into this whole topic. We should note that all these aforementioned features of the heavens that are not accountable by the nature of the heavens constitute [severally] proofs that the heavens are created by choice and voluntarily. Hence, we have many other proofs demonstrating creation besides those mentioned earlier [in chapter 7].

⁷It is not clear where in the *Physics* Gersonides finds Aristotle saying that voluntary motion is prior to all other kinds of motion. Aristotle actually says that *locomotion* is the primary type of motion (*Physics*, VIII:7), which is contrary to Gersonides' conclusion in this chapter. Indeed, locomotion for Aristotle is required for generation and corruption (Ibid., 260a 26-260b 5). But in this very same passage where Aristotle argues for primacy of locomotion, there is the suggestion, as Wolfson notes, that if the universe were created, another kind of motion would be primary, the motion of generation (Wolfson, *Cresca's Critique of Aristotle*, 632.) Now, since Gersonides has demonstrated that the universe is created, this motion of generation is primary; and since the generation of the universe is the expression of choice, Gersonides characterizes this motion as voluntary.

-257-

CHAPTER IX

WE shall now turn to the third of our criteria for created substances.] We maintain that there are many things in the heavenly domain that are for things other than themselves. And this^a is precisely one of the criteria for a generated substance, as [we have mentioned] previously.

The actual motions of the heavenly spheres -- through which the observed composite motion of the heavenly bodies is perfected, such that ^b from this motion this maximally perfect terrestrial world is perfected, ¹as we have indicated in Book 5 -- are necessarily for the benefit of something other than themselves, as we shall now prove. Everything that is present in the heavenly domain i.e., the shapes of the heavenly bodies, their distances from the Earth and the various properties of the heavenly bodies with respect to size, illumination, inclinations and the other ^c features in them we have mentioned -- is either because the existence of those motions needed for the perfection of terrestrial phenomena is made possible through these features; or because the terrestrial existents that derive from these motions are perfected ^d through them. Accordingly, it is evident that all of these above-mentioned features of the heavens are for the benefit of something else, i.e., the Earth. Thus, since it is clear from the preceding that whatever exhibits some thing which is for some thing else is necessarily generated, it follows from this that the heavens are created. The number of proofs for this thesis from this criterion [of generated things] corresponds to the number of factors that are [of this sort] in the heavens.

That the movements of the spheres are necessarily such as they are

¹Throughout this chapter Gersonides frequently uses the verb *shalem* to connote the process whereby something is brought to completion or perfection via some agent or prior process. The Hebrew term derives from Aristotle's technical term ἐντελεχεία, which for Aristotle connotes the actuality of something, as opposed to its potentiality (Aristotle, *Metaphysics*, IX:3, 6 and 8). This Greek noun derives from the adjective ἐντελής, which means "perfect, complete, full". In Latin the noun was rendered as "perfectio", whose verbal form also connotes "to bring about, accomplish, achieve".

Many of these connotations are captured by the Hebrew term *shalem*. In his translation of Maimonides' *Guide*, I: [73](#) - [74](#), Samuel ibn Tibbon uses the word as the equivalent for the Arabic *taqawwama*, which is rendered by Klatzkin and Pines [Maimonides, *Guide of the Perplexed*, trans. S. Pines, Part I, chapter 73, ad 5 (end)] as "constitute". The common idea underlying all these terms is the bringing to completion or perfection of some state or thing.

for the sake of other things can be shown as follows. Such motions are neither for the purpose of obtaining something necessary for themselves nor for fleeing something undesirable, as is the case amongst animals. For, unlike the latter, which require food and other things for their sustenance, the heavenly spheres do not need anything external to themselves for the perfection of their existence; nor is anything contrary to their nature which they have to avoid, since they have no contraries. Hence, their movements cannot be of this kind ^e. Moreover, they do not change their places. Thus, it is not possible for their motions to be for the avoidance of that which is contrary [to their nature] or directed for [the acquisition of] that which is appropriate [for them]. If we were to say that their movement occurs simply because they are living -- for motion is life ^f for natural things, as Aristotle has said, --, it would follow from this claim that the spheres have some kind of motion; it would not follow from it that they have the motions that they do in fact have, which motions are necessary for the perfection of terrestrial phenomena, as has been explained. Moreover, this hypothesis has nothing in its favor. The movements [having] characteristics of an animal as an animal are for the perfection of its existence; they are not normally gratuitous unless they are for the pursuit of pleasure, as in the case of the movements of a man while dancing. But the latter are only occasional, since the gratuitous is not "liked" by nature. Therefore, it is not possible that the continuous motion of the heavenly spheres be for their own sakes without anything good resulting essentially to them for themselves.

Someone might still object and say that this motion of the spheres is for the sake of the pleasure in what they apprehend, as is the case with men who undergo a [kind of] locomotion in acquiring knowledge. ² We reply as follows. In the pursuit of knowledge on a given question the investigator experiences motion because in his speculations he moves from certain things that lead him to the attainment of the truth in that inquiry; for the movements follow each other in the way that dancers move because of the movements in the song according to the fastness or slowness in the song. The same thing ^g happens when a person is arriving at ^h the truth on some question: according to the quickness or slowness in his thought in moving from one thing to another in his investigation; the fastness ⁱ or slowness in his movements [will vary]. However, the heavenly spheres do not move in order to acquire knowledge of something that they previously did not know; for in their knowledge there is

²The idea of the cognitive activities of the heavenly spheres was a medieval commonplace, based upon suggestions in Aristotle's *Metaphysics*, XII:7 (Maimonides, *Guide*, II:4-5. Gersonides, *The Wars of the Lord*, Bk. 5, pt. 3, chaps. 7-10, 13).

-259-

no element of potentiality; indeed, their knowledge and apprehension ^j is always actual. In fact, [their] cognition and apprehension do not necessitate motion; rather they [need] rest, as Aristotle has pointed out. ³ Thus, they ^k do not possess this kind of motion for the sake of cognition. Moreover, even if we were to admit that motion is necessary for them [i.e., the heavenly bodies] for the sake of this apprehension, it would not be necessary for them in the marvelous way in which it is [manifested in them], whereby there proceeds ^l according to this motion whatever proceeds to the terrestrial world [and] without which sub-lunar ^m phenomena would not be perfected. ⁴ Finally, movement by its very nature seems to impede cognition, as Aristotle has mentioned. This is the reason why a drunkard has difficulty in understanding intellectual matters when he is drunk; for his vigorous movements [impede cognition]. Likewise, [the movements] of a growing boy. It is evident then that movement is not a condition for knowledge. In conclusion, there is no way we could say that the heavenly motions are for knowledge unless we were to assume ⁿ that because they conceive of the law, order and rightness governing the earthly domain (as far as is possible for them) they desire to move by virtue of that conception in such a way that sub-lunar phenomena emanate from them in the best possible manner. But this entails that their movements are for the sake of something other than themselves, as we

³Aristotle, *On the Soul*, III:7 and 11.

⁴The text here is difficult; the manuscripts differ amongst themselves and from the printed editions. I give below the reading of the Leipzig edition (page [322](#), lines 14-17):



The underlined phrase is especially vexing. As it stands, it contains no subject for the verb



The Vatican, Oxford and Paris #723 manuscripts have the reading



, which does supply the desiderated subject. However, the phrase



is also difficult. It does not appear in two Paris manuscripts (#721 and 722), and may be an

explanatory gloss. Finally, after the word



the Vatican, Oxford and Paris #723 manuscripts add



. Following the advice of Professor Charles Touati, I propose this reading of the troublesome concluding clause:



Despite the problems in the text, Gersonides' philosophical point is not too difficult. It was objected that the celestial motions are not directed toward the sub-lunar domain but are exhibited for the sake of the heavens themselves, i.e., for their cognition of themselves and of their causes. To rebut this proposal Gersonides claims that if this celestial motion were for the purpose of the cognitive activities of the heavenly bodies, this motion would not be as complex and extraordinary as it is. Even assuming *ex hypothesi* that motion is involved in thinking and that the celestial motion is cognitive in purpose, one is not required to affirm that such motion needs to be so complex. After all, if Saturn does think, it ought to think in a more simple way than we do. The fact that the heavenly motions are complex shows that these motions have a purpose other than their own cognitive activities.

-260-

have maintained.

Once we realize that (1) the motions of the spheres are necessarily for other things, (2) that the existence of the stars and planets in the spheres are also for other things (as was proved in Book 5), and (3) that the shape, number, order, inclinations, etc., of the spheres are [such as they are] so that the movements of the planets are brought to perfection, it is clear that all these phenomena are in the heavenly bodies for the [benefit] of things other than themselves. Accordingly, from each one of these things in the heavens that exists for something else it can be demonstrated that heavenly bodies are created, as we have indicated in our earlier discussion of the properties whereby something can be recognized to be generated or not. ⁵

Aristotle himself seems to have anticipated this problem; therefore, he attempts to explain all these celestial properties as natural features of these bodies. Thus, he seeks to explain the east to west diurnal motion as a motion from the right to the front, for this motion is for it^o the most noble. ⁶ Aristotle believed that the heavenly bodies have a *left, right, forwards, and backwards* because they are like living bodies. It is evident that from this hypothesis it would follow that the position of the other spheres, which seem to us to move in an eastward direction, is the reverse of the position of the diurnal sphere. That is, *above* in the other spheres would correspond to *below* in the diurnal sphere, so that their motion would also be from the right to the left and in the forward direction. ⁷ Analogously, Aristotle explains the slower velocity of the upper planets (i.e., Mars, Jupiter, and Saturn) on the grounds that they are closer to the first sphere, which moves them contrary to the direction of their [own] motion. Hence, the first sphere impedes them to a greater extent^p from moving contrary to that direction because of their desire to follow its motion. ⁸ Again, he attempts to explain the large number of stars in the uppermost sphere and the presence of only one planet in each of the lower spheres on the ground that, if there were many bodies in the lower sphere, the uppermost body would tire in moving them all. ⁹ But with respect to the explanations he gives for the other properties in the heavenly domain, when they are closely examined, we shall see that all of

⁵Gersonides, *The Wars of the Lord*, Bk. 6, pt. 1, chap. 6.

⁶Aristotle, *On the Heavens*, II:5. s

⁷Aristotle, *On The Heavens*, II:2. L. Elders, *Aristotle's Cosmology*, (Assn, 1966), pp. 189-90.

⁸Aristotle, *On the Heavens*, II:10. According to Aristotle, the motion of the outermost sphere is simple, whereas the motions of the inner sphere are complex and opposite in direction to the former. Thus, the retardation of the bodies nearer to the outermost sphere is greater than those farther away from it.

⁹Ibid., II:12.

them agree with what we ourselves have posited about their nature, especially our claim that all these properties in the heavenly bodies exist for things here on earth in order that their generation and corruption preserve [some kind of] order and equilibrium. ¹⁰

It should be noted that Aristotle is silent on many of these issues, either because he was not able to explain them on the basis of their natures -- which he must do if he is to maintain the eternity of the universe -- or because the knowledge of astronomy and mathematics was deficient in his day. Nevertheless, he did agree that the heavenly bodies were effects, and therefore he tried to find the causes of their properties. In *On the Heavens* he says that if they were only causes, it would not be possible to look for the causes of the properties that they exhibit. ¹¹ But when he admits that they are effects, then he must admit that they are created absolutely; otherwise he is liable to the various absurdities we have previously discussed in chapter 7 of this Book. Consequently, Aristotle was perplexed by this problem, although he adduced many arguments in behalf of the thesis of eternity. His wisdom was so great that he could not hide himself from these difficulties; yet he was forced to his doctrine by the considerations previously mentioned.

[On the other hand], although Aristotle did sense the weaknesses of his arguments and the inherent difficulties of the eternity hypothesis, his followers failed to perceive [these problems] and thus believed that he had demonstrated this hypothesis. They described the manner of the

¹⁰Aristotle, *On Generation and Corruption*, II:10. I translate here the word *yosher* as "equilibrium", to correspond to Aristotle's notion of periodicity in this passage.

¹¹I have not been able to find the exact source of this reference to *On the Heavens*. Professor Friedrich Solmsen has suggested to me that one could consider the heavenly bodies as effects in so far as they are "made of" some stuff, or element -- the *aether*. The language used in these contexts may suggest, especially to someone looking for hints of creation in Aristotle, as Gersonides was doing, that the heavenly bodies are *produced*, and thus are effects (Aristotle, *On the Heavens*, II:7, 289a 11-12).

Another possibility is to consider planets and stars as effects because they are not selfmovers and hence require causes for their movements (Ibid., II:8, 290a 27-29). This suggestion becomes a main feature of Aristotle's views in Book XII of the *Metaphysics* (cf., Introduction of W.K.C. Guthrie in his translation of *On the Heavens* in the Loeb Classical Library, xxx).

Finally, in the opening paragraph of *On the Heavens* Aristotle describes the science of the heavenly bodies as in part concerned with their causes or principles (ἀρχαί). This phrase too can suggest that the heavenly bodies are effects.

Amongst the neo-Platonic commentators of Aristotle (e.g., Simplicius) it was quite common

to describe the world in general and the heavenly bodies in particular as "created" or "effects", with God as their efficient cause (ποιητικόν αίτιον). These views were known in the Muslim philosophical tradition and provided the source for the medieval doctrine of eternal creation (Averroes, *Taha-fut al-Taha-fut III*, pp. 103-04, especially van der Bergh's note 103.3).

-262-

necessary emanation of things from God as follows: one thing [i.e., an Intelligence] necessarily proceeds from God; from this [Intelligence] two things proceed because of its inherent compositeness; for in the latter there are two aspects -- one by virtue of which it thinks itself and one by virtue of which it thinks its causes. ¹² However, Averroes has pointed out the difficulties of this theory in his *Commentary on Aristotle's Metaphysics* and shows that this theory is not really the view of Aristotle. ¹³ Rather, [on Averroes' interpretation of Aristotle] two things are necessitated by the First Cause: the sphere of the fixed stars and the Intelligence that moves the next lower sphere. ¹⁴ Averroes also claims that this necessitation is only one of conceptualization and apprehension; and it is not impossible that diverse things can be apprehended in the apprehension of a single law. ¹⁵ [Nevertheless], it is evident (and should be noted) that Averroes' own theory is not free from difficulties. For he is open to the following question: from whom do the substances of the spheres derive, since they are effects, as Aristotle has mentioned in his *On the Heavens*? (It is as if the truth compelled him to make this admission). For the emanation perfected in his view is of conception and apprehension, not of the substance. ¹⁶ But if their substance is not the effect, how does it happen that these substances exhibit the optimal perfection for the perfection of what emanates from them? ¹⁷

Now with respect to Averroes' predecessors, when they claimed that the spheres and their movers emanate continuously from God, it follows from this thesis (1) that the spheres are generated from nothing and are destroyed into nothing *at each instant*, (2) that instants succeed each other, and (3) all the other absurdities, which we have mentioned previously. ¹⁸ Thus, some of the more recent philosophers have done better by

¹²Maimonides, *Guide*, II:22. Averroes, *Taha-fut al-Taha-fut*, 3rd discussion.

¹³Averroes, *Long Commentary on Aristotle's Metaphysics XII*, Arabic 1648 ff; Latin 327F-M. Wolfson, *The Plurality of Immovable Movers in Aristotle and Averroes*, 244-48; idem, *Averroes' Last Treatise on the Prime Mover*, 707-09. Barry Kogan, *Averroes and the Metaphysics of Causation*, (Albany, 1985), especially chapter 5.

¹⁴It should be recalled that for Averroes God is the mover of the sphere of the fixed stars. Gersonides rejects this claim. (Gersonides, *The Wars of the Lord*, pt. 3, chap. 11).

¹⁵Averroes, *Die Epitome der Metaphysik des Averroes*, trans. S. van der Bergh (Leiden, 1924), 131-32; *Taha-fut al-Taha-fut*, pp 108-09. Gersonides, *The Wars of the Lord*, Bk. 5, pt. 3, chapt. 6.

¹⁶Averroes' theory accounts for the emanation of the intellects, or movers, of the spheres, but not the spheres themselves, i.e., their very substance as a celestial *body*. In other words, how does a body (e.g., sphere) derive from an Intellect? (Maimonides, op. cit.; Touati, *La Pensée*, 318).

¹⁷If the substances of the spheres do not emanate from the First Cause, their beneficial influences upon the earth would be fortuitous or inexplicable.

¹⁸Gersonides, *The Wars of the Lord*, Bk. 6, pt, 1, chap. 7..

-263-

claiming that God has particularized and ordered whatever is found in the heavens. But this entails that the heavens are created, even though they do not realize this, as Maimonides reports.¹⁹ It is therefore necessary to realize that all of Aristotle's attempts to explain these phenomena by means of their substance and nature is inextricably problematic. It is as if the very nature of these⁹ phenomena resists such explanation. This confirms and makes evident what we have already demonstrated: that all these features of the heavenly bodies exist for things on Earth.

For example, Aristotle explains the diurnal motion as going from east to west on the grounds that the beginning of motion should move from the right, i.e., from the east, since the right is more noble than the left. And when the heavens move in the west (he continues) they move according to a secondary intention in order that the motion return to the right [i.e., the east], as occurs in the movements of living creatures.²⁰ This hypothesis is clearly artificial and dubious. The superiority of the right over the left in living things is connected with the difference in limbs which are in these sides [of the body]. But the heavenly spheres do not exhibit any diversity such that we could say that the right is superior to the left, all the more so since the right in the heavenly sphere becomes left.²¹ If someone were to suggest that the superiority of the right stems from the fact that it is in the east, as Averroes maintains, we reply that this suggestion is not adequate; for the differences amongst places with respect to rank and nobility is a function of the bodies that naturally belong to them, not of any [abstract] mathematical dimensions[†]. Therefore, since the body that is located at the right (or east) is in nature the [same] body as in the left [or west], there is no difference with respect to places.²²

¹⁹Maimonides, *Guide*, II:21.

²⁰Aristotle, *On the Heavens*, II:2.

²¹Unlike an animal a heavenly sphere or body has no *real* right or left side such that one could say that one side is more important than the other. In a left-handed baseball pitcher it makes sense to say that his left side is more "noble", or important; for by virtue of his left hand he throws the baseball, and thus excels. But the heavenly spheres, according to Aristotle, are *homogeneous* bodies: no one part or region of the sphere is better or even different from any other part. Moreover, in so far as these spheres are revolving around some fixed point, any part or region of such a sphere will be *both* a right *and* a left at some time in regard to some reference point or will be right and left at the same time to different reference points. In the next paragraph Gersonides will elaborate upon the essential relational character of these Aristotelian distinctions. Indeed, although the sphere may move "rightward", i.e., eastward, it eventually returns in a "leftward", i.e., westward, direction to its original point [A younger French-Christian contemporary of Gersonides, Nicholas Oresme, also rejected Aristotle's argument and for reasons similar to those of Gersonides. (N. Oresme, *Le livre du ciel et du monde*, ed., and trans. A. Denomy and A. Menut, (Madison, 1968), 409-11].

²²The heavenly bodies mover circularly, and thus occupy *all* places indifferently.

Moreover, with respect to "right" and "left" in these bodies, there is no definite place or part that is "right" *per se*. That there is no definite part that is "right"^s has already been demonstrated. That there is no definite place that is "right" can be demonstrated as follows. If we were to assume that there is a definite place called "right", e.g., the populated part of the earth, and similarly a definite place called "left", the left and the right of the sphere would be relative to another body [i.e., the earth], so that if the world's population were in the other part, right and left would be transposed. Consequently, these positions would not be absolute [or essential] to the sphere but relative to another body. But right is superior to left only if these positions are absolute and natural to the body, not relative to another body. For if [places] are relative to another body, then

some thing could at one time be in the right and at another time in the left, and thus one and the same thing would be more or less noble relative to another body. But this is absurd.

Finally, if it is claimed, as Averroes interprets Aristotle, that the sphere of the fixed stars is the sphere having diurnal motion, I maintain that in this case the motion would be from left to right, contrary to what Aristotle has assumed. This can be shown when it is determined which of the poles is the upper pole and which is the lower pole; for everything that has a right and a left has a top and a bottom and a front and a back, as Aristotle has proven.²³ We claim that it is evident that there are no differences amongst the heavenly spheres except with respect to the heavenly bodies within them or in their relations with other bodies. This is especially the case with respect to the four elements, since outside of the heavens there is nothing, as Aristotle has proved.²⁴ And if there were such a thing [outside of the outermost sphere], it would not possess different natures, as will be shown in this Book.²⁵ Hence, it will not be possible for the [outermost] sphere to have different sides with respect to that body. Thus, it is clear that what makes a sphere more noble with respect to its bodies is the numbers of heavenly bodies [i.e., planets and stars] contained therein, for the heavenly body is the most noble part of the sphere. And since it is evident that in the world of the elements [i.e., the sub-lunar world] the most noble region is the north, in which all the natural substances [formed] from the elements are found, it is clear for these reasons that the northern part of the zodiacal sphere [i.e., the sphere of the fixed stars] is the more noble. That is, in this part of the sphere more stars are located than are found in the southern part, as the results of the astronomers have indicated; and this part [i.e., the northern]

²³Aristotle, *On the Heavens*, II:2.

²⁴Aristotle, *On the Heavens*, I:9.

²⁵Infra, chap. 19.

is opposite the most noble part in the sub-lunar world. And when these points have been established, i.e., that the northern pole is more noble than the southern pole, and since it is evident that in an animal the top is more noble than its bottom and that in analogy with an animal the right side of a sphere is more noble than the left, as has been indicated -it is clear that if the sphere has top and bottom, it is more fitting that the northern pole be the upper pole. Now if this is the case, the diurnal motion is from left to right, which is contrary to Aristotle's position.²⁶ Consult the analogy given by Averroes in this context.²⁷

Furthermore, on [Aristotle's] theory it is difficult to explain why the motions of the other spheres are contrary to that of the diurnal motion. As Averroes has pointed out, it would be fitting that the motions of the other spheres be right to left. Accordingly, since it has been shown that it is proper for the term "right" and "left" in these latter spheres to be taken from the world of the elements, it is evident that such terms cannot be applied to these spheres in a sense contrary to the way^u they are applied to the diurnal sphere; for in both cases these terms are taken from the world of the elements and not from themselves. Finally, if we were to admit that right and left in these spheres are contrary to what they are in the diurnal sphere, we would find it difficult to explain why the positions of these spheres differ, unless we were to postulate an agent who intends that their movements be toward opposite directions, as we ourselves do in fact maintain. Hence, it is clear that the reason given by Aristotle in this context gives rise to inextricable difficulties.

Analogously, Aristotle's explanation of the different velocities of the planets [is beset with many difficulties. He explains these differences] in terms of their distances from the diurnal sphere: the

closer a planetary sphere is to the diurnal sphere, the slower is its motion, since the force received from the diurnal sphere which moves it contrary to its [own] motion is very strong; this force therefore prevents the planetary sphere from moving contrary to this direction [i.e., in its own natural direction]. Hence, the motion [of the sphere] contrary to that direction [i.e., its own natural motion] is slower. ²⁸This account is indefensible, and for several reasons.

In the first place, it would follow from this theory that the uppermost sphere moves the spheres below it without the motion from the upper spheres reaching the lower spheres. But this is absurd, as we have demonstrated in Book 5. And if we were to maintain ^v that the other

²⁶Aristotle, *On the Heavens*, II:2.

²⁷Averroes, *Commentarium de Libris De Caelo*, (Venice, 1562), 102.

²⁸Aristotle, *On the Heavens*, II:10.

-266-

[upper] spheres move of themselves because of their desire and choice [to imitate] the diurnal motion and because of their own [natural] and particular motions, many difficulties would thereby ensue, as we have indicated in Book 5. Moreover, Aristotle himself holds in the *Metaphysics* that *each* heavenly body has its own diurnal sphere. ²⁹If this is so, the reason Aristotle originally gave [to explain the differences in velocities] is obviously false.

Secondly, if Aristotle's theory is admitted [i.e., the theory in *On the Heavens*], it would follow that the motions of these ^w spheres [other than the uppermost sphere] are slower than the motions they would have had from their natures were it not for the motion of the diurnal sphere. This would mean that their proper motions are *forced* to be this slow because of the retarding force [of the diurnal sphere, which prevents] their natural velocities from being realized. This is utterly absurd. For if this were the case, their natural motion would be in vain, for they would have no instrument that could help them realize this natural motion. This is completely irrational. This view is similar to the view put forth by some of the ancient philosophers who say the earth does not move because its relation to the horizons [i.e., regions of the zodiac] is the same, which view Aristotle has already shown to be false. ³⁰In general, to assume that there is a nature which is never actualized is absurd; for that which is irregular in nature occurs infrequently, if it occurs at all. ³¹Moreover, an additional blemish on this hypothesis is its claim that there is an obstacle always preventing the heavenly bodies ^x from realizing that which they conceive with respect to their motion. For it would follow from this [hypothesis] that the order which they conceive would be alien to the order which emanates from them. For it has already been demonstrated that the influence they exert would be different if their velocities are quicker than if their velocities are slower. If it is claimed that these

²⁹Aristotle, *Metaphysics*, XII:8, beginning with 1073b 18.

³⁰Aristotle, *On the Heavens*, II:13, 295b 10 ff. Gersonides' point here should not be misunderstood: he is not defending the view that the earth moves. Rather, he is referring to Aristotle's critique of Anaximander, who claimed that the earth is immobile because of "indifference" (ὕψος ἰσοπέδου, i.e., its relationship to the Zodiac is indifferent, or uniform. In *On the Heavens*, II:13, Aristotle takes up the question whether or not the earth has any kind of motion, and critically discusses the various views of his predecessors. Although he himself defends the immobility of the earth, he rejects the arguments of Empedocles, Anaximander, and others in favor of this thesis.

³¹In this summary statement Gersonides refers back to Aristotle's original explanation of the

differences in planetary velocities in terms of the retarding motion of the uppermost sphere. If the nature of Saturn, say, is to move faster than it does but its motion is always being slowed-up by the counteracting motion of the outermost sphere, then Saturn's natural motion is never realized. For Aristotle himself this is an unhappy consequence, since nature does nothing in vain (Aristotle, *On the Heavens*, I:4, 271a 35).

-267-

spheres have two contrary desires, i.e., the desire to follow the uppermost sphere and the desire to move in the opposite direction [i.e., their natural motions] and that the former blocks the latter (as Averroes suggests), the previous difficulties [still] arise. In addition there is the absurdity of having two contrary tendencies coexisting in one body by virtue of which the sphere is supposed to move. We have demonstrated all these matters in Book 5.

Aristotle's attempt to explain why the uppermost sphere contains many bodies whereas the lower spheres contain only one body [is no more successful. According to Aristotle,] if the latter spheres had more than one body the uppermost sphere would suffer some weakness or loss of energy moving all of them. This hypothesis faces many difficulties. In the first place, the sphere and the heavenly bodies [contained within it] are of the same nature, as Aristotle has demonstrated. For if they were different in nature, the body would be fixed in its place by constraint [i.e., contrary to its nature], which is clearly absurd. Thus, if it is claimed that the uppermost sphere would suffer fatigue in moving the inner spheres if the latter had many bodies, it would be subject to this problem equally if they had no bodies, since the various parts of the spheres are all of the same nature,³² regardless whether or not they transmit light [i.e., have or have not stars or planets]. Moreover, it would also follow from this theory that the uppermost sphere would move all the lower spheres. But this has already been shown to be false. This theory also entails that [all] the spheres have the nature to possess more bodies [since their natures are uniform] but are prevented from having more bodies in order to enable the uppermost sphere to move them. Thus, this nature to have more bodies would be frustrated and never realized. But this is utterly absurd. Moreover, this hypothesis also implies that there is no reason why the spheres by their very nature should have any bodies at all. For^y on this hypothesis they would not possess any instruments [i.e., the stars or the planets] from which that which they conceive by means of their motion could emanate, and thus that which emanates would be different from the order that they conceive.³³

³²Since both spheres and the bodies in them have the same nature, the presence of the latter should not be relevant in determining the energy required to move the former. Indeed, according to Aristotle, the heavenly spheres and bodies cannot be said to be heavy or light (Aristotle, *On the Heavens*, I:3).

³³The different influences exhibited by the heavenly spheres stem from their different motions. But if the nature of the heavenly domain is such that there is no reason why one sphere has many bodies and another has only one, or indeed why the spheres have any bodies at all, then the order the movers of these spheres conceive for the sub-lunar world would not necessarily be translated into action, since the spheres might not have any bodies, or instruments, for this purpose. Thus, the motions exhibited by the spheres would not necessarily be the motions dictated by this plan. In this argument it is assumed that the heavenly bodies are instruments for the emanation of influences from the spheres (Maimonides, *Guide*, II:4, 6, 10).

-268-

It has been therefore demonstrated that Aristotle's attempt to explain all these phenomena in terms of the nature of the heavenly bodies has failed. This increases the evidence and perfection of our proofs showing that these phenomena are all for the benefit of the sub-lunar world to perfect [sub-lunar] generations. Aristotle admits as much, as we have already indicated; it is as if the truth forced him to this admission. To conclude, then, each aspect of the heavenly domain constitutes a proof for creation from three different points of view: (1) they are directed to some purpose to the maximum perfection possible, a feature that cannot be possessed by ungenerated and subsistent substances; (2) they have properties that do not derive from the nature of the heavenly spheres, which is also a feature that cannot be possessed by eternal substances; (3) they are directed in the best manner possible for the benefit of noncelestial things, and this is again a characteristic not possessed by eternal things. Thus, the total number of proofs available to us^z from things in the heavens [showing] that the heavens are generated is arrived at by multiplying all these different phenomena by these three factors. ³⁴

³⁴That is, each property that cannot be explained within Aristotle's system constitutes three proofs, since it is a purposive, non-essential and earth-benefiting property.

CHAPTER X

AFTER having demonstrated by means of the properties of the heavens that the heavens are necessarily generated, it is now proper to inquire whether or not time itself is generated; for, by nature of this [determination] we shall then be able to answer the question whether there has been an infinite series of generated universes, a belief that was maintained by some of the ancient philosophers. ¹For if the heavens are generated but time is eternal, then there would necessarily be an infinite series of created universes. On the other hand, if it is not necessary that time be eternal, it would not be necessary that an infinite series of universes would be successively [generated]. And if it were impossible that time be eternal, then such a series too would be impossible. Moreover, since Aristotle actually constructed a proof for the eternity of the heavens on the basis of the nature of time, which would then raise questions about our previous argument about the nature of the^a heavens, it is necessary for us to examine this problem in detail. But before we investigate whether or not time is generated, it is proper that we discuss the essence of time, which [topic] will guide us in arriving at the true answer to the former question.

Now it is evident that time is a kind of quantity, for we describe it as being equal or not equal, which features^b belong to the category of quantity. That it is a continuous quantity is also clear, since we describe it as either long or short. ²Moreover, it is entirely measured by any of its parts conventionally, not naturally. ³This too is a feature of continuous magni-

¹The Stoics, for example, advocated this view [F.J. von Arnim, *Stoicorum veterum fragmenta*, (Leipzig, 1905-24), 4 Vols, II, par. 620]. Such a view is also expressed by one of the Rabbis of the Midrash ("Genesis Rabbah", III, quoted in Maimonides, *Guide*, II:30.

²These features are true of a continuous magnitude: *Kamah mitdabbeq*; ζέγεθος συνεχη + ζ Aristotle, *Categories*, 6, 4b 20-22, 5b 3; *Physics*, IV:11, 219a 10-13). A continuous magnitude is one in which the parts have common boundaries, or limits, such that the boundaries flow into each other and become one (*Physics*, V:3, 227a 10-15).

³*Be-hanahah* ("by convention"); *be-tevâ* ("in nature"). These terms express an old distinction in Greek philosophy between *That which is by convention* (θU=1F73σει) and *that Which is by*

nature (οὐσει). This distinction was probably first introduced by the Sophists in moral and legal philosophy to differentiate between moral-legal principles that have absolute, and hence universal, validity-natural laws -- and those principles that are relative to specific times and places -- conventional, or positive, law [Plato *Gorgias*, 483-84; *Protagoras*, 337e; Cicero, *De re publica*, III:22. Paul Friedlander, *Plato: An Introduction*, (New York, 1958), chap. 16]. The Greek term θέσις derives from the verb τίθησι "to put", "to lay down". In conventional law the law-giver lays down the law. In Latin this notion was rendered by the verb *ponere*, "to put or place"; thus, we get *positive law*. The Greek and Latin terms are literally rendered by the Hebrew *hanahah*, "putting", "placing down", i.e., law by decree. Obviously such laws are conventional, since they reflect the particular social environment in and for which they are instituted. The equivalent term in Arabic is *wad*. Now the extension of this distinction to natural philosophy is less obvious. Gersonides' discussion here is based upon Aristotle's essay on time in *Physics IV*:10-14, wherein Aristotle links time and motion and considers both to be continuous quantities. In *Physics IV*:11, 219a 13-20 Aristotle speaks of the terms "before" and "after" first as they function in space and then in motion and time. With respect to the former he claims that before and after are applicable "by convention" (τη + ᾠθέσει), i.e., relative location. He then makes an analogy between space on the one hand and motion and time on the other hand; hence, before and after in time will also be by convention [C. Touati, *La Pensée*, 226. E. Hussey, *Aristotle's Physics: Books III and IV*, (Oxford, 1983), 147]. Now what does this mean? Any temporal magnitude can be measured, or marked off, in a variety of ways without affecting the temporal order in, or distance between, events. For example, it is our current practice to date events by means of a solar calendar such that one year consists of 365 1/4 days and 12 months, whose length varies from 28 to 31 days. But all of world history can be equivalently dated by adopting a Jupiter calendar, whereby one Jupiter year is equivalent to 12 solar years. Each solar year is then roughly equal to a Jupiter "month". Now, although it is a matter of convention which chronological system we employ, the facts of the world remain the same. For example, let us suppose that Reuben is 12 solar years older than Joseph but only six solar years older than Judah. In that case, the same amount of time has elapsed between the birth of Reuben and Joseph and between Reuben and Judah as has elapsed if we were to formulate these relationships in terms of Jupiter years. Even though in Jupiter years Reuben is only one year older than Joseph and one-half year older than Judah, the three brothers have the same temporal relationship to each other as they have when their ages are described in solar years. In this sense then temporal measurements are conventional [*Crescas, The Light of the Lord*, III:1,3.].

-270-

tudes. Furthermore, the limit in time is the instant, which, although a limit, is also a beginning; but the instant itself is indivisible. ⁴

Whether time inheres in a subject or is separate from a subject is a topic that we need to investigate; for one of these two conditions should be true of it. That it is not in a subject is evident; for if it were, it would be multiplied according to the number of subjects. But this is false, since there is only one time, as Aristotle has shown in the *Physics*. ⁵ Yet time is not separate from a subject. To demonstrate this let us postulate the following two known axioms: Firstly, time is such that one part [of it] differs [sequentially] from another part; for this [particular] part of time is different from both the preceding and succeeding part of time. ⁶ If this

⁴Aristotle, *Physics*, IV:10, 218a 6-10; IV:11, 220a 4ff; IV:13, 220a 10ff.

⁵Aristotle, *Physics*, IV:14.

⁶In *Physics*, IV:11, 219b 9-10, Aristotle characterizes time as καὶ ὡσπερ ἡ κήσις αἰεὶ ἄλλη καὶ

ὁ ἄλλη χρόνος -- "Just as the change is always other and other, so the time is too ..." The phrase ἄλλη καὶ ἄλλη -- "other and other" -- corresponds to the Hebrew *heleq zulat heleq*. The connotation of this phrase is that the parts of time are successive or sequential, and hence always different from each other (Ibid., 218a 9-0). [E. Hussey, *Aristotle's Physics: Books III and IV*, (Oxford University Press: New York, 1983) ad locum].

-271-

were not the case, there would be no difference between past and future time; but this is absurd. Moreover, if time did not have this characteristic, it would be possible for two contrary states to exist in one subject at one time and in the same respect. [But] contraries are by definition such that they can exist in the same subject and in the same respect only at two ^c [different] times. If the times were not different, then the contraries would exist simultaneously in one and the same subject. [But this is absurd]. ⁷ Secondly, the parts of time qua time are homogeneous. We have stipulated here that we are concerned with time as such. For it might be thought that there is a difference between daytime and nighttime or between autumn-time and summer-time. These differences, however, are only accidental. They do not reflect any essential properties of time as such.

Given these axioms we now say that time is not separable from any subject. If it were separable from a subject, it would follow because of its homogeneous nature that its parts would not differ from each other. For in a homogeneous quantity the parts differ only because it is [differentiated by] a subject; hence if there were no subject, the parts would not differ from each other. But since in time the parts are different from each other, it follows that it is not separable from a subject. ⁸ Moreover, if time were separable from a subject, it would follow that the part would be identical with the whole. Since each part of a homogeneous quantity has the same name and definition as the whole, the part is differentiated from the whole by the subject. Hence, if there is no subject, the part would be identical with the whole -- which is utterly absurd.

Now after having just shown that time is not in a subject nor is it separable, and since there is no *tertium quid*, it is necessary to say that time is in a subject from one point of view and that it is separable from another point of view. It is clear that the previous difficulties resulted because of our assumption that time is either in a *particular* subject or that it is *absolutely* separable from any subject. But if we say that it is in some indefinite subject, we are not faced with those difficulties. As to what is this subject, it is clear that it is motion, as has been demonstrated in the *Physics*. ⁹ The relation of time to movements is similar to the relation between a number and what is numbered: just as the number is itself not multiplied even though it can number a plurality [of aggregates], so too time is not multiplied when it measures several motions. In this respect it is free from a subject such that it is not in a particular place. And even

⁷Aristotle, *Metaphysics*, IV:4.

⁸Aristotle, *Physics*, IV:11.

⁹Aristotle, *Physics*, IV:11.

-272-

if it is related ^d to the diurnal motion, this is only a matter of convention, not nature. For when it is measured by any motion whatever, it is measured in terms of before and after; and if it is measured by before and after, it is measured by time. ¹⁰

Now that we have determined the nature of time, we have to discover what type of being it possesses: does it exist in potentiality [only] or in actuality; or is it something between potentiality and actuality? Moreover, if time is between actuality and potentiality, [it can be asked] whether or not it matters if this difference pertains to the past or the future. A further question would be whether time is one or many; and if many, whether [this plurality] is coexistent [*yahad*] or is such that one time-series comes into existence after the other vanishes.

Concerning the being of time, it is evident that it is not utterly potential. For if it were, there would be no difference between past and future; all time [qua potential] would be future time, since this is the nature of the utterly potential. On the other hand, time is not completely actual; since no given part of time ever exists simultaneously [i.e., at one moment]; that which exists simultaneously is the instant, which is not [part of] time. ¹¹ No alternative remains for us but to say that time is something between potentiality and actuality, just like motion; and this is appropriate, since time is an accident attached to motion.

Accordingly, let us now ask whether there is a difference ^e between the parts of time in the sense just indicated, such that some part of time has the status of actuality ¹² and ^f some part has the status of potentiality. That is, is it the case that the past is actual, whereas the future is only potential; or are both of them potential, since no part of time exists in actuality, neither the past nor the future; or is it the case that the future is actual and the past potential? It is evident, however, that potentiality is properly attributed to the future, not to the past; hence the aspect of potentiality with respect to time belongs to the future, not to the past. The situation with respect to time is the same as it is in motion. For motion is something in between potentiality and actuality, and the past states of

¹⁰ According to Aristotle it is just as correct to say that time is measured by motion as it is to say that motion is measured by time (Aristotle, *Physics*, IV:11, 219a 5-219b 12, IV: 12, 220b 15-18). In *Physics*, IV:14, 223b 15-23, Aristotle remarks that the movement of the diurnal sphere measures time [F. Solmsen, *Aristotle's System of the Physical World*, (Cornell University Press: Ithaca, 1960), 146].

¹¹ Aristotle, *Physics*, IV:10, 219a 5 ff.

¹² Gersonides uses a juridical term here, *din*, "judgment". In the Talmudic legal idiom this term connotes *has the legal status of*. Maimonides uses the Arabic equivalent of this term several times in the *Guide of the Perplexed*, I:73, beginning; I:74, first and sixth methods. Pines translates this term as: "status" (I:73 and I:74, sixth method), "rule" (I:74, first method).

motion are actual. Motion, however, differs from time in the following respect: in motion the moving body exhibits actual traces of what it has acquired of actuality, ¹³ [albeit] incompletely, by virtue of the motion it has traversed. In time, however, such a trace is not found in the time that has transpired, except in the motion that this time measures. It can also be shown as follows that time is [progressively] actualized in a forward direction ¹⁴ and that potentiality in time is always in the future, not the past. If time in its entirety were potential, time would not measure the passing motion that is progressively being generated; for the latter is in some sense actual. Hence, the measure of this [completed] motion measures it in actuality, and it would be impossible for time to measure it in actuality ^g if it were not actual in some sense.

I shall explain this in another way. If the past and the future were equally both potential, then the existence ^h of each member of a disjunction of possible states of affairs [i.e., Z will occur or Z will not occur] could take place in the past, as they could take place in the future. But this is

obviously absurd. That it follows from the hypothesis that the existence of each member of a disjunction of possible states of affairs could take place in the past, as it is possible in the future, is quite evident. What prevents each alternative of a disjunction of possible states of affairs from taking place in the past is precisely the fact that past time has already been actualized in some sense; whereas this is not the case with the future. Thus, [genuine] possibility is possible in the future. There is no possibility in the past, since one of the possible states of affairs of a disjunction has already been actualized. ¹⁵ Moreover, if both past and

¹³*Shelemut*. Here the term expresses Aristotle's term ἐντελεχεία (*kamal*), which has been rendered as "actuality" (*Physics*, I:2, 186 a 3, Charlton in Oxford Clarendon Aristotles Series) or "complete reality" (*Metaphysics*, XI:9, 1065 b 22, Tredennick, in Loeb Classical Library). Motion by its very nature is incomplete: it is a *process* tending toward completion. As such it is not fully actual; yet it is not wholly potential, since the distance, for example, a body moves *has been* traversed. Motion is then literally "transitional", from the Latin *transeo*, "to pass over" (Wolfson, *Crescas' Critique*, 526).

¹⁴*Al nekhohuto*. Wolfson translates this phrase in this context as "in a forward direction" (*Crescas' Critique*, 387. See also Klatzkin ad locum).

¹⁵The problem here is an interesting and still important issue in the philosophy of time. Is the past completely closed such that nothing *new* can occur in it? It would seem so, and that is why we believe that the past is all over and done with. If this is the case, then there is no genuine *contingency* in the past, where the truth-state of every proposition is determinate and fixed. For example, the sentence "Abraham Lincoln was assassinated in 1865" has a definite and fixed truth-value -- true. His murder is no longer a contingent state of affairs, or a "possibility", to use Gersonides' term (*'efsharut*). For if it were, it could be undone. Throughout this discussion the word *'efsharut* has the connotation of *contingency*: *A* may or may not occur. Several medieval philosophers restricted the notion of possibility to the future, labelling this possibility, "the truly possible" (Maimonides, *Treatise in Logic*, chap. 4).

-274-

future time were equally potential, the statement "Tomorrow the sun will be in the Zodiacal sign of Aries" would never be true. For [on this hypothesis] when some time has elapsed, the day has not yet come closer to its completion, but that whole day remains always and uniformly in potentiality. It is not possible for that day ⁱ to be actualized and completed. This is of course absurd. It is obvious that a day continually comes closer to completion by virtue of ^j that part of the day which has already been actualized, such that when the day has been completed the sun will be, say, in the position of Aries; for the existence of that day has in some sense been actualized. When all of this has been understood, it will be evident that although no [definite] part of time is now actual, past time has in some sense the status of actuality, whereas future time has the status of complete potentiality. ¹⁶

Let us consider now the questions whether or not time is one or many, and if [many] whether [it is many] in the sense of coexistent [parts] or in the sense of successive [parts]. ¹⁷ It is clear that it is not many in the sense of co-existent [parts]; for time is not in place such that it can be made many in this way, as has been explained in the *Physics*. ¹⁸

¹⁶In these last two paragraphs Gersonides has argued that although the two parts of time, the past and the future, have a "shadowy" existence since the one is "no longer" and the other is "not yet", the past does have a claim to actuality; for in so far as some past event *has already occurred*, the history of the world is, so to speak, filled up by this event. In this sense the past

is "closed". Once a statement is true or false, that's it. Nothing can change it [A. Prior, "Thank goodness that's over", *Philosophy*, 34 (1959) 17]. This closed character of the past can be considered as connoting or implying its actuality, or reality. All the events of the past *did happen*. They have made a difference as to what happens now or in the future, even though the agents in these events are no longer around. In contrast, the future is "open": we don't know now whether on January 14, 2090 there will be someone walking on Mars. This "iffiness" of the future implies, for Gersonides, its essential potentiality, or contingency.

¹⁷Here Gersonides is concerned with the question, how can we speak of plurality with respect to time? If we do ascribe plurality to time, is this plurality one of co-existent parts; or does it consist in successive parts? In space, we can talk of a plurality of parts in so far as any spatial magnitude, e.g., a square yard, can be divided into nine equal co-existent parts. Can we say the same about time? This question is part of a more general issue: to what extent are time and space analogous? In recent years this has been widely discussed in philosophy [George Schlesinger, *Aspects of Time*, (Hackett Publishing Co.: Indianapolis, 1980), chapter 1].

¹⁸Any spatial magnitude can be divided into many co-existent parts, or regions. Each such region is differentiated from the others by having a unique locality relative to the other regions. We can refer to, say, the northeast corner of a field; or even more specifically we can single out any region no matter how small or large, by some mapping system, say latitude and longitude. Thus, what makes space divisible into co-existent parts is that these parts have a local relation to each other. Now, time is not like space in this regard. For its parts are not "localized" such that each part is distinguished from another by reference to a coordinate system that relates simultaneously enduring parts; for no part of time is simultaneous with another. Rather, the parts of time are such that when one exists, the others do not; i.e., time is a *successive* continuous magnitude [Aristotle, *Physics*, IV. 10, 217b 35-218a 7].

-275-

Similarly, it can be shown that time is not *essentially* numerically many in the sense of successive parts. For if this were the case, plurality would be like, e.g., the plurality amongst the individual men [in the species man]: they are essentially many and are generated one after the other. That they [i.e., the men] are essentially many is evident; for each one of them is numerically one, and by nature, [or essence], not by convention. ¹⁹Now if this were the case with time, it would follow that these [individual] units [of time], by virtue of which time^k is essentially many, would be such that each of them co-exists [with the others]; but this is absurd, since if it were true it would mean that such units would be instants, which are neither time nor parts of time. ²⁰Or, it would follow that these units would be such that not all of them co-exist [with the others] e.g., these units are like days and years. ²¹Now, if the latter alternative is adopted, these units would have definite boundaries and a middle such that neither the boundary nor the middle is interchangeable with each other. For if this is not so, there would not be an essential plurality in the parts of time; rather the plurality would be by convention. ²²Accordingly, it is evident that there cannot be an essential plurality in time in this manner [i.e., the second alternative]; for in time as such there is no natural, [or essential], definite terminus such that it cannot be the middle, since whatever can be thought to be a terminus can be the middle. ²³

¹⁹In a series of humans, successively generated one after the other, each one is numerically differentiated from the others by his or her *fixed* place in the series. Adam and Eve generate Cain who with his sister generate in turn Enoch. The sequence here is "natural" in the sense that it cannot be arbitrarily changed with the same historical and biological results; for the preceding member of the series is the *natural cause* of what immediately follows it. In a conventional, or merely positional, series, however, there is no fixed or causal relationship

between its members. For example, the school children standing in line waiting to enter the assembly hall, may be arranged in *any order whatsoever or no order at all*; nor is the child standing behind or in front of another child the cause of the other. The position each child occupies is arbitrary.

²⁰Co-existent units would be analogous with the points on a line all of which exist together. But according to Aristotle, the points on a line are not parts of the line, since they have no magnitude. The same holds for the instants in time: they too are not parts of time since they have no duration (Aristotle, *Physics, IV*: 10, 218a 5-9, 220a 15-19).

²¹A day is successively generated as each of 24 hours passes. No two hours exist simultaneously.

²²In the generation of a day, each hour has fixed termini, or boundaries, as well as a middle; if these boundaries and mid-points were not fixed, the day would not come about, since if these points were interchangeable, we could "go backwards in time" and a complete day wouldn't be reached. Wherever the sequence is such that you can "play around" with the members with impunity, the sequence is merely conventional.

²³Unlike a day or year, time as a whole has no definite boundaries such that any two termini and their mid-point are fixed. Rather, any given temporal stretch, say an hour, is such that its starting point, or *terminus a quo*, can be the mid-point of another temporal interval. For example, 12:30 PM is the mid-point between 12-1 PM. But 12:30 PM could also be the *beginning* of my class which ends at 1:30 PM and whose mid-point is at 1 PM.

-276-

Moreover, those parts are continuous with each other [in such a way that there is a] continuity [between] the parts of one part of them with the parts of the other. Thus, it would follow that if that part were one, time as a whole would be one.

It has been demonstrated that time is not essentially many, neither in the sense of a co-existent nor a successive [plurality]. However, the numerical plurality in time in the succession [of its parts] is one of convention, not nature; for the plurality in time concerns only the [extended] magnitude. ²⁴ Thus, it is one in actuality but many in potentiality, as is the case in [extended] magnitude. ²⁵ But [in the latter case] the extension has coextensive [parts] whereas time and motion do not. ²⁶ Moreover, a difference exists between time and motion on the one hand and extended magnitude on the other: in the latter before and after are conventional, not natural; hence, it would be possible [in an extended magnitude] for that which is before [something else] to be behind it, if the boundary of the latter is placed before [it]. But this is impossible in time and motion; for in the latter cases that which comes after cannot in any way [be placed] before that which is before. In this respect time and motion are like pure numbers; for in the latter prior [and posterior] are by nature. ²⁷ Hence, in pure numbers one cannot add at both ¹ ends [of the

²⁴*Shi'ur, izam (uzm), miqdar, b'ud; quantitas*. The Hebrew term *sh'ur* has several meanings, of which these three are relevant in Aristotle's *Physics*: extension, magnitude and measure. Since two sentences later Gersonides will contrast time with *sh'ur*, the latter two meanings of magnitude and measure are not applicable. After all, time is a magnitude and a measure. Rather, the intended contrast is one between time on the one hand and space, or extension, on the other (Wolfson, *Crescas' Critique of Aristotle*, 419, 603, 651. Maimonides, *Guide*,: II, Introduction, Prop. 1. G. Sarfati, *Mathematical Terminology in Hebrew Scientific Literature of the Middle Ages*, (Jerusalem, 1968), p. 123.

²⁵Any continuous magnitude is one quantity, e.g., one day, one square yard. But it can be "made many" by dividing it into 24 hours or 9 square feet. This "multiplication" is potential, whereas the quantity is actually *a* magnitude.

²⁶As indicated in note 24, Gersonides now contrasts time and motion with another kind of magnitude whose parts are co-extensive, whereas the parts of time and motion are not. This other kind of magnitude must be extended, or spatial; for only a spatial magnitude has co-extensive parts. In the next sentence Gersonides will make a further distinction between time and space.

²⁷At this point the earlier distinction between nature and convention in time becomes a bit confusing; for now Gersonides claims that unlike in space priority and posteriority in time and motion are fixed, or natural. Take a square yard: each of its square units can be rearranged without changing the character of the square yard as a whole or the relationships amongst the constituent units. In general, spatial magnitudes are such that their parts are reversible. This is not the case with time, or motion, where the order is irreversible. No matter which chronological system is adopted, Washington's Birthday comes after Lincoln's Birthday. In this respect time is more like number than space; for in the natural number system 4 is after 3 and that's it. You can't reverse the order and get the system of natural numbers. In this sense time, motion and number are different from space: they are magnitudes whose ordering is fixed; i.e., sequence in these magnitudes is determinate and rule-governed. In space, however, "sequence" is really arbitrary, or conventional. Nevertheless, one needs to remember Gersonides' earlier point that time as a measure is conventional.

-277-

series], which is possible in extension; for in the former there is nothing before the number one.

-278-

CHAPTER XI

AFTER having determined the general nature of time, it is now appropriate to examine whether it has been created absolutely or if it is eternal. Now it would seem that time is necessarily created. Quantity as such is finite, for it is by virtue of a [determinate finite quantity] that the quantity of a magnitude is known; [for example], when we ask about a quantity, [how much or how many?]. Accordingly, since time as such is obviously a quantity, it follows that time is finite. In addition, it is evident that quantity as such is finite in so far as it is a measure and a determination ¹of the magnitude. Indeed, the truth of this becomes evident when you examine by induction ^a the genera of quantity [and] find that all of them are finite. For body, surface, line, and place are necessarily finite; [indeed], it has been proved in the *Physics* that body is necessarily finite. ²Accordingly, since place is in some sense the limit, [or boundary], of a body, for the place [of a body] is that at which the body terminates and is equal to the extension, [or magnitude], of the body which surrounds it, it is evident that place is also finite. ³Similarly, it can be proved that surfaces are finite since they are surfaces of finite bodies. Analogously ^b, lines are finite, since they are lines of a surface, which is finite. Similarly, numbers are finite, since any number is either even or odd, and this [property] is its limit. These cases clarify further and complete our previous point that quantity as such is finite.

Now it might be objected to this proof that there is a sense in which quantities can be infinite: numbers can be augmented *ad infinitum* and magnitudes can be divided *ad infinitum*. Similarly, it can be proved that magnitude as such can be augmented *ad infinitum*. For it is not impossible for magnitude as such to be larger than the universe; what is impossible is ^c that it be infinite. According to Aristotle, it is impossible for a body to be larger than the universe, since there is no place greater than this world and ^d there is no body outside of the universe [to "contain" the universe]. ⁴This impossibility, however, is not due to its being a body, but due to the impossibility that it should be infinite. This is evident from

¹*Shiur vehagbalah*. Here the term *shiur* has the connotation of measure (Wolfson, *Crescas' Critique*, 419). The term *hagbalah*, deriving from *gevul* "limit", connotes the limiting of a magnitude into a determinate quantity, e.g., 4 feet [Klatzkin, *Thesaurus*, ad locum].

²Aristotle, *Physics*, III:5-7.

³*Ibid.*, *Physics*, IV:2, 209b 1-4.

⁴Aristotle, *Physics*, IV: 2, 4-5; *On the Heavens*, I:5-7, 9

-279-

what Aristotle has proven by several proofs. ⁵Now when it has been established that quantity does exhibit some kind of infinity, it might be thought that this is possible in time too. But this is contrary to what was previously proved.

Nevertheless, it can be easily shown that this argument in no way refutes the principle we have established before, i.e., that quantities as such are necessarily finite, since it is the nature of quantity that entails [its finitude], as we have seen. The lack of a limit in numbers and in extension is not the lack of a limit in the quantity, but the absence of limit in the *act* of division or addition. That is, as long as you divide it, there is always the potentiality of division because of its continuous nature; or as long as you increase the number there is the potentiality for [further] augmentation. Nevertheless, the resulting division or increase remains finite. For a number is not potentially [augmentable] in the sense that it can yield something that is not a number; but it is potentially [augmentable] in so far as it can become a larger number. Thus, it does not have the potentiality of being infinite; for it has been demonstrated that every number is finite. ⁶Similarly with respect to magnitudes; a magnitude is potentially augmentable not in the sense that it can become something that is not a magnitude, but in the sense that it can become a larger magnitude. Accordingly, since all magnitudes are finite, as Aristotle has demonstrated, the absence of a limit in this context is not the lack of a limit in the quantity itself, but only the absence of a limit in the *act* of augmentation, since the magnitude always preserves its finitude as long as you augment it. Indeed, the claim that numbers and magnitudes are potentially infinite in quantity is clearly false. For numbers and magnitudes are potentially just numbers and magnitudes, i.e., they do not become something in a different genus because of this potentiality. Thus, since numbers and magnitudes as such limit what they encompass, they are not infinite in quantity either actually or potentially. ⁷

From this very proof it can be shown that a magnitude does not contain an infinite number^e of parts, neither actually nor potentially. If there were potentially an infinite number of parts, something would follow

⁵Aristotle, *Physics*, III:5.

⁶Aristotle, *Physics*, III:6, especially 206b, 16 ff.

⁷Gersonides is actually criticizing Aristotle's notion that there can be quantities that are *potentially* infinite. To Gersonides this is a loose and misleading mode of expression, since every number and extension is always finite, as Aristotle himself admits. On this point Gersonides' view is closer to Descartes' analysis; for Descartes also finds the term "infinite" to be misleading in this context and replaces it with the term "indefinite" [Descartes, *Principles of Philosophy I*, 26-27. I. Efron, *The Problem of Space in Jewish Medieval Philosophy* (New York, 1917), 56-60, 99-103. T. Rudavsky, "Creation, Time, and Infinity in Gersonides", *Journal of the History of Philosophy*, 26 (1988), 25-44].

-280-

that is obviously absurd; a magnitude assumed to be finite would be infinite in quantity. For that which is continuous [and composed] of infinite parts is itself infinite in magnitude, since each one of these parts, into which it is potentially divided, is an [extended] quantity. A magnitude cannot be divided into anything except magnitudes. It is therefore evident that whatever the magnitude of any of these infinitely [many] parts, that which is composed of them would be infinite in quantity. Similarly, an extended magnitude cannot be said to consist potentially of an infinite number of points. For if there were an infinite number of points, even potentially, there would be potentially an infinite number of parts, which has just been shown to be false.⁸

What we meant, however, when we said that a magnitude is indefinitely divisible is that the *act* of division preserves something in potentiality [i.e., divisibility is never exhausted], although the number of divisions is always finite.⁹ The situation here is the same as in numbers: i.e., just as numbers can be indefinitely augmented without becoming potentially anything but a finite number, so^f the number of divisions of an extended magnitude can always be augmented without being potentially anything but a finite number [of such divisions]. Likewise understand the infinite augmentation which we have claimed to be possible in an extended magnitude; i.e., it can be augmented potentially by only a finite number of parts. For if this were possible [i.e., if an infinite number of parts could be potentially added], the magnitude^g [which is finite as such] would be capable of becoming infinite in quantity^h, and this has been shown to be absurd. The absence of a limit, however, lies in the *act* of addition, while the number of parts is always finite, even if the number is indefinitely increased. When this point is appreciated, it is clear that in quantities as such there is nothing of infinite magnitude. However, there is an absence of limit in an accidental [sense]; i.e., in the acts of division and addition. Now this is necessarily true for time as such: i.e., time is indefinitely and continuously divisible and augmentable; but the augmentability is only possible from its successive aspect [i.e., the future], since potentiality in time is a feature only of succession, as we have explained [in the previous chapter].

Someone might still argue that even though the previous proof has established that time must be finite in quantity, it does not follow that time is created absolutely. It might be the case that finite time is a part of

⁸Any two points demarcate a part of a spatial magnitude. If there were an infinite number of such points, there would be an infinite number of parts, which conclusion is incompatible with the preceding argument.

⁹There is no *a priori* fixed limit to the act of division, although the number of parts divided is always finite (Aristotle, *Physics*, III:6, 206b, 16 ff).

time and that before it there was [another] finite part and before the latter there was another part and so *ad infinitum*. For this is not impossible in bodies; i.e., it is not impossible in bodies that a part can be generated or perish *ad infinitum*. Accordingly, since time vanishes as it is generated in a forward direction, i.e., as each of its parts is generated another part perishes, it is not impossible that time be infinite in this way: for any finite part of time there is always a prior finite part *ad infinitum*, each part succeeding the other.

We reply as follows. It has already been demonstrated that time as a whole is continuous and one, and that it is not essentially many, just as it is the case with bodies. Now, just as bodies are not infinite precisely because they are one and continuous, and this is because of their nature as quantities, so too time is finite because of its unitary and continuous character. Moreover, it would be false to say that the parts of time are quantities [i.e., finite] but time as a whole is not a

quantity, [which is implied by the above objection]. For time consists of homogeneous parts; hence the part has the same name and definition as the whole of which it is a part. But since it has been proven that time as a whole is a quantity, it is evident from what has preceded that time is finite, since this is a feature of all quantities qua quantity.

A further objection has been raised to the effect that if bodies, extensions and numbers are infinite because of the element of potentiality inhering in them, i.e., infinite divisibility and augmentation, and since it is clear that time exhibits no element of actuality, it should then be infinite, since that which is found to be infinite is so from its potential character. Indeed, Aristotle himself claimed that time was infinite by means of this argument. After having demonstrated the impossibility of infinite magnitudes, Aristotle realized that there is a sense in which such magnitudes are possible, i.e., infinite divisibility of continuous magnitudes and infinite augmentability in numbers, and he argued as follows:

"Since these things [i.e., divisibility and augmentability] do entail the existence of an infinite, whereas our previous arguments against infinite magnitudes excluded the infinite, it seems that the only way [to resolve this apparent inconsistency is to say] that the infinite exists in one sense but does not exist in another sense. The impossibility of the infinite demonstrated earlier is the denial of an actual infinite, [e.g., an infinitely large body]. But these things that entail the infinite in time and extension derive from the potentiality" [for further divisibility and augmentation]. ¹⁰

¹⁰Aristotle, *Physics*, III:6, 206a 8-18.

Now Aristotle's arguments concerning the infinity of time rest upon his analyses of the nature of the instant and of generation and corruption; for it seemed to him that such analyses entailed the impossibility of a beginning of time, as we mentioned in our report of Aristotle's arguments for the eternity of the universe. We shall show later that Aristotle's arguments for the non-created character of time are not demonstrative. Here, however, we shall examine whether it follows from the non-actual nature of time that it is infinite.

We claim that this thesis is not necessarily true. The absence of a limit that is true of magnitude and number is applicable to time only because the latter is continuous and capable of indefinite augmentation. But it does not follow from this that time is infinite in quantity; for [the phrase] "absence of a limit" is used with respect to these two things equivocally. In the one case it connotes a quantitative accident, such as addition or division; whereas in the other case it connotes the quantity itself. Thus ⁱ, saying that addition and division are infinite is different from saying that a quantity is itself infinite, as has been explained. Therefore, we cannot conclude that in time the lack of a limit is in its quantity from what we find in number and in magnitude with respect to the lack of limit in the accidents of quantity, e.g., addition and division, but not in quantity itself. This is quite evident. Moreover, the absence of a limit obtaining in numbers and magnitudes derives from the aspect of complete potentiality [in them], not from the aspect of actuality [in them]; for the actual result of any act of division or addition is finite. But with respect [to time] the absence of a limit would be actual in some sense, i.e., past time, a factor that makes the analogy [with numbers and magnitude] not entirely correct. Time has an absence of limit, however, in its completely potential nature, i.e., its successive aspect, although each successive segment of time which emerges into actuality is itself finite in quantity. ¹¹

Furthermore, we do not admit that numbers, bodies, and magnitudes are finite merely because they exist in actuality, as Aristotle maintains. Rather, we argue that they are finite simply

because of the nature of quantity. This is clearly proven [by numbers]: numbers are necessarily finite, even though they do not exist in actuality. This is clearly the case when the numeration is merely potential. This is evident from Aristotle's proof that numbers are finite. ¹²For it is clear that numbers can be attributed to that which is potential. Consequently, we can talk about great

¹¹Gersonides has established in the previous chapter that past time is in some sense actual; hence, if time were infinite there would be an actual infinite. The infinity in numbers and magnitudes is admitted by Aristotle to be potential only. Therefore, the analogy between these quantities and time breaks down.

¹²Aristotle, *Physics*, III: 5, 204b 6-8.

-283-

and small in time because of the number which accrues to it and which is clearly potential, since there is no great in time except in a potential sense, as we have already proven [earlier in this chapter]. Similarly, numbers can be assigned in the potential division of an extended magnitude; yet each such number is necessarily finite, as has been shown. Furthermore, it is also evident that potentiality as such does not imply infinite quantity: rectilinear motion is always potential; yet it is finite, as Aristotle has proven. ¹³Finally, our previous analysis has shown that the analogy between numbers and magnitude on the one hand and time on the other does not prove that time is infinite in quantity, i.e., from the [common aspect] of potentiality resulting from the absence of limit [in these magnitudes]. For we have shown that the term "absence of a limit" is equivocal in these two cases. Thus it follows that time is created; for if time were not created, it would be infinite in quantity, which is not the case of any quantity qua quantity. ¹⁴

That it is impossible for time to be infinite in quantity [can be demonstrated in another way]. By induction we see that in all the categories bodies and their properties are finite in essence, and that if they exhibit some aspect that is infinite [i.e., infinite divisibility and augmentability] it is only accidental. Hence, since it is also evident that time is a property of a body -- for time is attached to motion and motion is attached to that which is moved, which, as Aristotle has proved, is necessarily a body^j -- we can construct the following syllogism: Time is a property of bodies; bodies and all their properties are essentially finite, unless they exhibit a lack of a limit, which is an accident. Therefore, if this is so^k, time is essentially finite; if it exhibits some absence of a limit, it does so only by accident, just as in any case of a quantity, of which time is one kind. That bodies and their properties are essentially finite can be demonstrated as follows. It has already been proved that bodies by their very nature as quantities are finite. Similarly, surfaces, lines, places, and num-

¹³Aristotle, *Physics*, VIII:8.

¹⁴The general point of these difficult arguments is that potentiality as such is not a sufficient condition for the infinity of a magnitude. Aristotle seemed to think that it is the potential nature of time that accounts for its infinity. This suggestion was reinforced by infinite divisibility and augmentation, which are also potential. Gersonides argues, however, that the term "infinite" is ambiguous in its application to numbers and extensions and to time. Hence, the analogy Aristotle employs is not correct. Moreover, potentiality itself does not guarantee infinity, since each result of a possible, or potential, division or addition is a finite magnitude. Gersonides' point is that magnitudes are finite simply because they are quantities, i.e., it is an essential feature of a quantity to be limited. Infinite divisibility and augmentation are accidental features of quantity. Indeed, they are acts of individuals who divide and count, not properties of the magnitudes themselves (Jakob Karo's dissertation is still useful: *Kritische*

bers are all finite. The only sense in which continuous magnitudes can be infinite is, as we have indicated, infinite divisibility and augmentability. But as quantities they do not lack a limit. Thus it is evident that in quantity as quantity there is nothing infinite, except accidentally, i.e., by way of addition or division.

When we consider the substantial features of a body, i.e., its form and matter, we see that they are also finite, as Aristotle has demonstrated in Book I of the *Metaphysics*.¹⁵ For the forms which a body can assume, one via another, are necessarily limited, and each form itself is also limited, in so far as a limited number of activities are derived from it. This is self-evident. Analogous considerations hold with respect to the matter [of a body].

The [elementary] qualities that a body can receive are also limited, both with regard to the number of qualities and their intensity.¹⁶ That the body is limited with respect to the intensity of the quality is evident; for each quality is limited. For example, in the case of the affective¹⁷ qualities there is no infinite heat or cold. For if there were such a thing, there would be no greatest distance [between two contrary extremes]; and it has been said in the definition of contraries that they are at the greatest distance.¹⁸ Similarly, the number of affective qualities is circumscribed, since that which is apprehended of them by the senses involves two contrary properties [e.g., black and white], and other things in that species are the intermediary properties [e.g., blue, green, red, etc.] that fall between the contrary extremes. Now since the extremes are given, the number of intermediaries is circumscribed and limited. Moreover, as the species of qualities perceived are known and circumscribed, that which is in the genus of affective properties is circumscribed and limited, both with respect to [its] intensity and number.¹⁹

This is also true in the genus of psychological characteristics.²⁰ A virtuous trait, for example, is finite in or intensity, since it is in [a state of] equilibrium, whereas its opposite inclines towards one of its extremes.

¹⁵ Aristotle, *Metaphysics*, I:2 994a 1-994b 30.

¹⁶ *Atzmut*. This term usually signifies the substance, or essence, of something. However, as the example of heat and cold in the next sentence shows, Gersonides seems to be using *'atzmut* here in the sense of intensity (Maimonides, *Guide*, I:9).

¹⁷ *'Ekhut hipa 'aluti*; παθητικαὶ ποτότητες "passive", or "affective" qualities (Aristotle, *Categories*, 9a 29-9b8).

¹⁸ *Takhlit ha-merhaq*. This phrase seems to be the equivalent of Aristotle's *ζεγίστη διαφορά* "the greatest difference". By this term Aristotle defines the extreme qualities, or contraries, of a range of properties; e.g., black and white are the extremes, or contraries, defining the range of colors (Aristotle, *Metaphysics*, X:4, 1055a 3 ff. Touati, *La Pensée*, 222).

¹⁹ Aristotle, *Posterior Analytics*, I:22 83b 3-16; *On Sense and Sensible Objects*, VI, 445b 22.

²⁰ Aristotle, *Categories*, 8, 9b 35 ff.

The intermediary states of these characteristics are also finite, since the extremes are given. Moreover, the number of psychological traits that a person can exhibit is necessarily also finite.

For it is impossible to assume that a person has the potentiality for an infinite number of perfections, as is evident to anyone who has read this book.

It is also evident that natural capacities or incapacities [are finite]. ²¹Take any specific natural capacity characteristic of a species [e.g., health] and you see that it is limited, i.e., the excess does not extend infinitely. For if it did, then some individuals in that species would be imperishable, since in them the natural capacity [for survival] would be infinite. But this is absurd. Thus, the natural capacity of an individual is limited; and by parity of reasoning the natural incapacity is limited. Hence, the intermediary conditions between the two extremes are also limited and circumscribed.

Quantitative qualities are as such also finite in intensity, as is evident in the case of numbers. Since each number is finite, it can be proven that each even number is finite and that each even-times even number or even-times odd number is also finite. ²²And similarly with respect to the prime number and composite, [i.e., non-prime] number, as well as all other properties of numbers: [they are all finite]. And so it can be proven, for example, that the types of various numbers are finite; since if there were an infinite variety of numbers, then some number among them would be infinite, which has been shown to be false.

[Finitude] in extension can be seen in the case of figures. Each figure is limited and circumscribed, for it is bound by a line or lines or a surface or surfaces. Similarly, the number of kinds of figures is finite; for the different genera of elementary shapes are circumscribed, i.e., either by one line [in the case of a straight line] or by more than one line. Now with respect to the latter figures there is not an infinite number or different species of such shapes. For if there were, there would be one such figure having infinite lines; and if this were the case, this figure would have a circumference that is infinite. But this would entail that the figure itself be infinite. ²³But this is absurd, since every figure is necessarily finite.

That such a figure [with infinite lines] is infinite in size can be demonstrated as follows. Euclid has proved that a figure composed of straight lines can be analyzed into a set of triangles according to the number of lines circumscribing it. Consequently, if there were such a figure [with

²¹Aristotle, *Categories*, VIII: 9a 14-17.

²²H. Wolfson, *Crescas' Critique of Aristotle*, 477-78.

²³If there were an infinite number of kinds of figure, then one such type would be a figure of infinite size; for if there are infinite possibilities, then one such possibility is the figure of infinite size (Aristotle, *Physics*, III: 5; *On the Heavens*, III:4).

infinite lines], it would be analyzable into an infinite number of triangles, and hence the figure itself would be infinite in extension. From this it can also be demonstrated that a solid figure [i.e., a body] must be finite in the kinds [of shapes it can assume]. For if it could have [an infinite number of shapes], then it would be possible for a body to have an infinite number of surfaces. But this is false, for it would follow from this that a finite body would be infinite, since it would be analyzable into an infinite number of cones.

That [the kinds of] lines [are finite] can be proved as follows. The kinds of primary lines are finite, since a line is either straight or curved. Now the species of lines, i.e., the rational in square, the medial and other irrational lines -- are all finite in kind. ²⁴For it is evident that it is

possible to separate off from any given line all these species, whenever we make one and the same point from the extremities of this given line the beginning of all these kinds of lines. This is evident from Euclid. On the other hand, if the variety of lines were infinite, then any given finite line would consist of infinite points, which is impossible potentially and actually, as has been shown before. ²⁵And so it has been shown that the properties¹ of a body are limited [i.e., finite].

Places too are limited. Natural places are definite and circumscribed; and places by position are also finite; for places are places in and of bodies, and a body is necessarily finite. Similarly, the number of possible places a body could be placed in is not infinite. For if they were infinite, then a [finite] body would be divisible into parts encompassed by an infinite number [of places], and a finite body would then become infinite. ²⁶In general, since the notion of place is employed to make known the location of that which has place, as [for example] when we ask, "where is it," it follows that this notion is circumscribed and limited. ²⁷

²⁴A straight line (*qav yashar*) can either be *rational*, or commensurable (*medabber*; ρητος; *muntiq*), i.e., completely measurable by some other line, or irrational (αλογος; *ghairu muntiq*), or incommensurable, i.e., not measurable completely by another line. Some rational, or commensurable, lines are measurable, however, only in square (*medabber beko'ah* δυνάξει σὺςζετρος), i.e. measurable by their square roots. The medial straight line (*qav memutza'*) is an irrational line produced by lines that are commensurable only in square [*Euclid's Elements*, Book 10, Definitions 1-3; Proposition 21. Heath's notes to his edition (2nd edition, Dover Books: New York, 1956) are invaluable. See also Shmuel ibn Tibbon's lexicon to his Hebrew translation of Maimonides *Guide under qav medabber*].

²⁵Gersonides, *The Wars of the Lord*, vol. 2, Bk. 3, chap. 4.

²⁶That is, if a body could occupy an infinite number of places it could be infinite (Aristotle, *Physics*, III:5).

²⁷If we were to ask where is the Eiffel Tower and get the answer "in infinite space" or "in an infinite number of places", we would not know its location.

-287-

With respect to the category of *when*, ²⁸it is evident that it too is definite, indeed, essentially so. For if we are asked about it [i.e., some event], the answer is that it happened at such a moment or at such a time [i.e., at a *specific* moment or time]. Now I say that there cannot be an infinite^m number of *whens* [i.e., an infinite number of temporal *loci*]. For every *when* is such that its distance from [a given] present moment is necessarily finite. If there were an infinite number of *whens*, then the time that is between the *when* which is farther than [a given] present moment [e.g., the present] and this present moment [itself] would thereby be divisible into an infinite number of parts. Hence, the time that was originally assumed to be finite in quantity turns out to be infinite in quantity. But this is false. ²⁹

With respect to relative terms [i.e., the category of relation], ³⁰it is evident that [they too are finite]; for the kinds of primary relations ³¹are necessarily circumscribed by number. And this is evident from the relations that are found in each category, which is necessarily circumscribed. ³²Indeed, the categories themselves are circumscribed [i.e., numerically limited]. Therefore, the kinds of primary relations are circumscribed. And since the relative in one such kind of relation is one -- for the rela-

²⁸*matai; póte*. (Aristotle, *Categories*: 2a 2).

²⁹It will be useful here to recall Gersonides' earlier conclusion that the claim that an extended

magnitude can be divided in potentia into an infinite number of points is tantamount to the admission of an actual infinite. [Gersonides, *The Wars of the Lord*, vol. 2, Bk. 3, chap. 4]. Accordingly, if the possibility of an infinite number of *whens*, or temporal *loci*, is admitted, any finite interval of time is divisible into an infinite number of temporal parts, which means, according to the above conclusion, that the interval itself is really infinite.

³⁰*Ha-mitzta'ref*; τὸ πρὸς τι. The term *mitzta'ref* was used primarily in the medieval terminology to designate the entity that had a relation to some other entity. The relation itself was designated as *ha-hitza'arfut* [Aristotle, *Categories*, 1b 27,6a 36 ff; *Metaphysics*, V:15. I. Efros, *Philosophical Terms in the Moreh Nevukim*, (New York, 1924), ad loca. J. Weinberg, *Abstraction, Relation, and Induction*, (Madison, 1965), 68-111].

³¹I'm not sure what the extension of the term "primary relation" is: perhaps Gersonides is referring to the first type of relations distinguished by Aristotle in *Metaphysics*, V:15. These are arithmetical relations.

³²This passage is obscure.



As in the previous discussions of each of the Aristotelian categories, Gersonides wants to show that the terms in each category are finite. In the case of relations he wants to show that the kinds of primary relations, i.e., numerical relations such as *double*, are finite in number and scope. I have construed the underlined phrase as referring to the thesis, insisted upon by Abraham ibn Daud, that relational terms are found in almost every category (Abraham ibn Daud, *Emunah Ramah*, 6-7. H.W.B. Joseph, *An Introduction to Logic*, 64. Julius Weinberg, *Abstraction, Relation, and Induction*, 74).

-288-

tive of something conveys as such the essence of that of which it is the relative ³³-- relations [in general] are limited and circumscribed.

Someone might object to our claim here that the relative of a thing is only one because it conveys the essence of the thing to which it is related [as follows]. One could imagine that with reference to the term "few" in number or "large" and "small" in extension there are *infinitely* many things related. For example, let us suppose that for the relation few the number is 2: now 2 is related to 3, since the number 3 ⁿ is many relative to it. But the same is true for every number after 3 *ad infinitum*. Similarly, this can be shown for the terms "large" and "small" in extension. ³⁴

The solution to this problem is easy. With ^o respect to the essence of the relation it is necessary that the relative in the case of the term "few" be numerically one; it is, "many". However, it can happen that to this [relation, i.e., "few"] there are many relatives in so far as we have construed its relative as a *particular* many [i.e., 3 or 4 or 5]. But this is only accidental; for in respect to the relation itself which it possesses essentially [the term "many"] only con.³⁰ote ^pmany in an absolute sense, [i.e., more than 2]. ³⁵In the same way the problem with the relation "largesmall" in extension can be solved. For it is evident that this relation essentially ^q connotes only one thing; nevertheless, it can happen that there are many relatives when the relative to *small* is taken to be a *particular* large thing or when the relative to *large* is taken to be a *particular* small thing. ³⁶

The category of *state*^r [or *condition*,] is also limited. ³⁷The various states attached to a thing, e.g., being shod or clothed in the case of a man or having bark or leaves in the case of a tree, are necessarily limited [in number]. This is true for all such states, whether physical or psychological, as we have pointed out, i.e., they are all limited.

The categories of *action* and *affection* ³⁸ are also [limited]. For every

³³ Aristotle, *Categories*, 8a 35.

³⁴ The objection claims that contrary to Gersonides' previously stated thesis, it is possible to find a relation that has infinitely many relatives.

³⁵ Gersonides distinguishes here between the relation itself and the things that are related, the relatives. Although there are many numbers that are greater than the number two, the relation *few-many* is *one* relation, i.e., to the concept *few* the concept *many* is uniquely related. To understand the force of the objection one should note that in the Aristotelian view of relations the relation is treated as an accidental property of the things related. Hence, the relation itself possesses the minimum ontological status (Weinberg, op cit., 68-69).

³⁶ Again one has to distinguish between the relation itself and the particular entities that are related by this relation. In this case, the relation *large-small* is one relation, although many items can be larger than a particular small cat.

³⁷ Now Gersonides discusses Aristotle's category of ἔχειν, which was rendered into medieval Hebrew either as *lo* or *qinyan* (Aristotle, *Categories*, 1b 26, 2a 3-4, 11b 12-14).

³⁸ *Po'al* ("action"); ποιεῖν; *hipa'alut* ("affection"); πόσχειν (Aristotle, *Categories*, 1b 27-28).

-289-

body performs a limited and circumscribed activity. Similarly with *affection*: the affection ^s [involved] in an affective quality ^t is limited since that quality is itself limited. In general, since the affection is either in the categories of substance, quality, quantity, or place, all of which are limited ^u, it is evident that affection is limited and circumscribed. In the case of affection in the category of substance, its limit [i.e., end-point, or completion] is the substance that emerges at the end of the generative process. In the case of affection in the category of quality the limit is the quality that is generated at the end of that process of being affected. In affection in place the limit is the particular place reached [by a body]. And in affection in quantity the limit is the final quantity reached by a growing organism. Thus, it is evident that action and affection ^v are essentially limited, [i.e., finite].

This limitation is also true with respect to the number ^w of things that have these affections. For affection in the category of substance takes place in things that are finite, since substances are finite in number. Similarly with affection in the category of quality; for the number ^x of qualities is finite, as we have seen. The same is true for affection in place: for the number of places is finite, as we have pointed out. Finally, affection in quantity is finite in number; for the size attained by a growing organism is limited in excess or deficiency [i.e., finite], and hence that which is between these extremes is also limited.

With respect to the category of position ³⁹ it is also evident that a position is as such definite. For if it were not definite, it would not be knowable, since one can make it known [only] in so far as it is definite. But it is necessary for a position to be knowable; hence it must be definite. Moreover, the kinds of positions that one thing can assume are finite ^y in number. For a position of a thing is the relation of its sides ^z to the sides of the thing that surrounds it. And since the number of sides of the surrounding thing is finite, the number of positions is finite. That the number of sides of the surrounding body is finite can be demonstrated as follows. If the number of sides could ^{a1} be infinite, the surface of that body having such a position would be divisible into parts circumscribed

³⁹ The *position* (*Matzav*; κείσθαι) of a body is actually different from the *location* (*'anah*; που +

) of the body. The latter is the *place* of the body, whereas the former concerns the *posture* of that body relative to or in its location, e.g., lying down or sitting up (Aristotle, *Categories*, 2a 3). Samuel ibn Tibbon defines the position, or posture, of a body as the relation of definite parts of a body to definite parts of the place in which the body is located; e.g., in standing a man's head is situated one way with respect to the ceiling of the room in which he is located, whereas when he is lying down his head is situated differently (S. ibn Tibbon, *Explanation of Philosophical Terms to the Guide for the Perplexed*, v. Matzav).

-290-

by an infinite number. But this has been shown to be impossible. And so we have demonstrated that bodies and all their properties are necessarily finite. This is what we proposed to prove.

Moreover, that it is impossible for time to be infinite in quantity [can be proved in another way]. If time were infinite, then past time would be infinite in quantity. This can be shown to be false as follows. It is demonstrable that the quicker heavenly spheres have more rotations in a given period of time than do the slower spheres. It is also demonstrable that if the number of rotations ^{b1} for one sphere in a given period of time is not greater than the number of rotations of the other, the motion of one sphere would not be faster than the motion of a second sphere. This is self-evident. It is also obvious that there are differences amongst the velocities of the heavenly bodies, e.g., the velocity of the diurnal sphere is greater than the sphere of the fixed stars. But if time were infinite in the past the universe would be eternal -- which is implied by the assumption of the infinity of time, for eternal and continuous time cannot be derived from linear motions, as has been explained in the *Physics* ⁴⁰-- then the number of rotations circumscribed by each heavenly body [in infinite time] would be infinite. Yet an infinite number is obviously neither larger nor smaller than another infinite number, since the fact that one number is larger than another is attributable necessarily to the fact that it is ^{c1} finite, as is evident. And since all of this has been established, I now argue that if past time were infinite in quantity, there would be no faster or slower velocities amongst the heavenly bodies. For in past time, which has been assumed to be infinite, the number of rotations of a "fast" sphere would be infinite and the number of rotations of a "slow" sphere would also be infinite. And since no infinite number is larger or smaller than another infinite number, no sphere would be faster than another. For if one sphere were faster than another, then the number of rotations of the faster sphere would be, in one and the same time, necessarily greater. But this is obviously false since observation shows that some spheres are faster than others. In general, since the motion of a fast sphere throughout all of past time (considered in a forward direction) is greater than the motion of a slow sphere by a definite proportion, the ratio of rotations of the former to the rotations of the latter is proportionate to their ratio of velocities. ⁴¹And since this would not be possible if any of these numbers were not finite, it is necessary that these num-

⁴⁰Aristotle, *Physics*, VIII: 8-9, especially 265a 25.

⁴¹Where r_1 and r_2 are the number of rotations of two planets throughout time, and V_1 and V_2 their respective velocities, the following equation obtains: $r_1/r_2 = V_1/V_2$

-291-

bers be finite. Hence, past time must be finite. ⁴²

I say furthermore that past time cannot be infinite. If past time were infinite, then the duration of the lunar eclipse in past time would also be infinite. For if the duration of the eclipse were finite, then past time as a whole would be finite [which is *contra hypothesem*]. And since past time [as

a whole] is no greater than the past time during which there has been a lunar eclipse -- for each of these is [on this hypothesis] infinite^{d1} and it is not possible for one infinite past time to be larger than another infinite past time -- and since it is obvious that there is only one time, it follows that the moon would be always eclipsed throughout past time. But this is obviously absurd. In short, since infinite past time [as a whole] is the very same time as the infinite time [of the lunar eclipse], because there is only one time, and since one infinite time cannot be a part of the other,⁴³ the moon would be always eclipsed throughout all of past time. By a similar argument it can be shown that [on this hypothesis] the moon would not be eclipsed at all in past time. For [if past time were infinite], the time that the moon is not eclipsed is also infinite. And then it would

⁴²Beginning with this argument Gersonides will construct several arguments having the same logical structure. They all attempt to show that if past time is assumed to be infinite, several absurdities follow. These arguments presuppose the principle that no infinite magnitude can be larger or smaller than another. From this principle and the assumption that past time is infinite, Gersonides now argues that it would be impossible to explain the observed differences in the velocities of the heavenly bodies, since in infinite past time, the number of rotations for any two planets, for example, would each be infinite, and hence their velocities would be the same. The originator of this argument seems to have been John Philoponus. Exploiting the principle that no infinite can be greater than another, he argued against the eternity of the world by showing that this latter thesis leads to several "paradoxes of the infinite." At this juncture Gersonides repeats many of these arguments. The basic thrust of the argument is especially telling against Aristotle, since one can find in his writings the idea that one infinite is no larger than another [Aristotle, *Physics*, 204a 20-26; *On the Heavens*, I:7, 275b 13-29. H. Wolfson, "The Kalam Arguments for Creation in Saadia, Averroes, Maimonides, and St. Thomas", *Saadia Anniversary Volume, Texts and Studies*, American Academy of Jewish Research (New York, 1943), 219 ff]. Philoponus' general argument has been studied by Herbert Davidson in his "John Philoponus as a source of medieval Islamic and Jewish proofs of creation" *Journal of the American Oriental Society* 89 (1969), 357-91 and more recently his *Proofs for Eternity, Creation, and the Existence of God in Medieval Islamic and Jewish Philosophy*, (Oxford, 1987), chap. 4; and Richard Sorabji, *Time, Creation, and the Continuum*, (Ithaca, 1983), chap. 14 and in his anthology of essays *Philoponus and the Rejection of Aristotelian Science*, (Ithaca, 1987), especially chap. 9.

Jehudah Halevi and Maimonides report this argument as a Kalam argument: Halevi, *The Kuzari*, V:18, Maimonides, *The Guide*, I:74. Averroes attempts to answer this argument in the *Tahafut al Tahafut (Incoherence of the Incoherence)*, trans. S. van den Bergh (London, 1954), First Discussion, pp. 9-10. See Davidson, *Proofs...*, chap. 5.

⁴³If one infinite magnitude were a part of the other, it would have to be as a part smaller than the infinite magnitude that contains it, i.e., the whole; but they are (*ex hypothesi*) each infinite.

follow both that the moon is eclipsed and is not eclipsed at the same time; if so, two contrary states would be in one subject at the same time; but this is utterly false. [Thus, the moon would never be eclipsed].

By means of this argument it can also be demonstrated that [on this hypothesis] it would follow that the part of the moon that emits light, i.e., the part facing the earth, would always be both east and west of the sun at the same time. But this is obviously false. For the time that the moon is east of the sun in this past time is necessarily infinite if time is assumed to be infinite in the past.

Similarly, the time that the moon is west of the sun [is infinite]. Hence, it would follow that the moon is both east and west of the sun simultaneously throughout all of past time. And if so, contrary states would be simultaneous. All of this is absurd. And again, it would follow from this hypothesis that the light of the moon as observed on earth would continually increase and decrease simultaneously [since the infinite periods overlap]. This is utterly absurd. Similarly, it would follow that Saturn, Jupiter, Mars, Mercury, and Venus would be continually both east and west of the sun at the same time throughout past time. And of course this is absurd. Other consequences would be that these planets would have both regular and retrograde motions simultaneously throughout past time and that they would incline in both northerly and southerly directions at the same time. But these consequences are all utterly false. This general line of argument is similar to the proof that Aristotle himself uses to show that the motions of the heavenly bodies do not become stronger or weaker. ⁴⁴

I can demonstrate the absurdity of infinite past time in still [another way]. It is evident that each part of time can be uniformly the answer to a temporal question *when?* by virtue of the homogeneous nature of the parts of time, just as each part of space can be uniformly the answer to the question *where?* in the sense of position, [as distinct from the natural place of something). Now since there is no such thing as an "infinite when", ⁴⁵ it is evident that any part of past time must be a finite distance from any fixed point [e.g., the present]. But if past time is assumed to be infinite, then the proportion between the time in which there ^{e1} is no *when* [i.e., infinite past time] and the time in which there is a *when* [i.e., any finite interval] would be infinite. For, given any *when*, the proportion between the time preceding it [which is *ex hypothesi* infinite] to the time which is between ^{f1} that given *when* and any fixed point [e.g., the present] would be infinite. Now it has already been granted as self-evident and

⁴⁴Aristotle, *On the Heavens*, I:3, II:6.

⁴⁵All answers to the question *when?* are definite intervals or dates, as was demonstrated earlier in this chapter.

indubitable that any part of time is uniformly a *when*. But we now have an impossible contradiction. Hence, past time is necessarily finite. ⁴⁶

I can show the absurdity of infinite past time in yet [another way]. Time ^{g1} is a continuous [magnitude composed of] its parts; and its quantity is generated with the forward, [or progressive], generation of motion, just as the quantity of its parts is generated along with the generation of the motion that it progressively measures. ⁴⁷ [Indeed,] any generated quantity qua generated necessarily increases continuously as long as the process of generation continues. This is evident [in the generation] of the parts of time. And the same is true for the [generation] of time as a whole, since it is one and continuous, as has been demonstrated. Once this is understood, I now argue that infinite past time is an absurdity. If it were possible, there would be no effect in what is generated from the motion with the increase of time. Rather, it would be necessary that its magnitude, if we assume something is subtracted from the motion which has passed successively *ad infinitum*, would not be smaller than if we had added to it some [amount] from the motion that is to come successively in the future *ad infinitum*. ⁴⁸ But if the increase or decrease of motion has no effect upon the quantity of time, time would not be generated from motion; and its existence would be, if we suppose that there is no motion at all, like its existence ^{h1} if we were to suppose that there are many more increments of motion than there were in the time that has passed. ⁴⁹ But this is obviously absurd. For it has already

⁴⁶The following diagram may be helpful:



q = a given *when* p = the present, or any fixed temporal point, or moment.

The length pq is a finite value k; but the length qr is infinite. Hence the ratio $k/r = \infty$. This destroys the homogeneity and uniformity of time, since on the hypothesis of infinite time some of its parts can be *whens*, or temporal *loci*, whereas other "parts" cannot (Aristotle, *On the Heavens*, I:6, 274a 8-9. Tamar Rudavsky, "Creation, Time, and Infinity in Gersonides", *Journal of the History of Philosophy* 26 (1988) 30-31).

⁴⁷Aristotle, *Physics*, IV: 11. Wolfson, *Crescas' Critique of Aristotle*, 387, n.142.

⁴⁸If past time were infinite, then differences in motion do not make any differences in time, since an increment or a decrease in motion does not affect the quantity of time, which remains infinite (Saadia Gaon, *Book of Beliefs and Opinions*, Book I, 8th theory, 3rd argument. Thomas Aquinas, *Summa Contra Gentiles*, II:38).

⁴⁹This is a difficult argument. I take it to mean that if time is such that any increase or decrease in motion makes no difference in its quantity, then it would be immaterial if motion exists at all or if the amount of motion that has taken place were many times greater than has actually transpired. That is, time would be completely independent of motion. Such a view was actually advocated by Plotinus and advocated by some of the medievals (Wolfson, *Crescas' Critique of Aristotle*, 96ff, 654 ff).

In translating this passage I have followed the reading of the Vatican manuscript *-kametzi'uto* which I believe makes more sense than the reading of the other manuscripts and the Leipzig edition. It should be noted that the difference between the readings hinges on the letters



which were written in almost the same way in many scripts.

-294-

been proved that time is generated from motion as the latter is progressively [generated] and that it measures motion in so far as it is one and continuous, since time has no parts in actuality, as we have already shown. Hence, the quantity of time continuously increases as long as the motion, which it measures, is generated. In short, if the quantity of time did not increase by virtue of the motion which is generated -- and it has been shown from the nature of motion that it is entirely generated successively -- then the quantity of time would not be generated from motion. But this is clearly absurd. For it has been demonstrated in the *Physics* ⁵⁰ that time is an accident attaching to motion because it counts motion with respect to before and after.

Now once this is established one of two things follow: (1) Either we say that time is generated from motion and increases with the generation ⁱ¹ of motion, as seems to be the case from the nature of motion; and if so, past time would be finite. Or (2) we say that time is generated from motion until it becomes infinite, and afterwards there is no effect [in the quantity of] time in its generation of motion. But if this is so, it would follow that infinite time, at the time of its generation from motion, would be generated from it successively, and thus would be finite before it was infinite. And it is in this manner that it is generated from motion; for if it were always infinite, it would not be generated from motion at all. But if we were to posit that time is finite before it is infinite, time would then have a beginning and that which exists of it [i.e., any of its segments] would always be finite. For if it were possible for time to become infinite by means of addition after having been finite, the moment at ^{j1} which it becomes infinite is

intermediate between the infinite and the finite, and the intermediate between two things [i.e., extremes] is such that the negation of the extremes is true of them. If this is the case, the quantity of this intermediate is neither^{k1} finite nor infinite, and this is obviously false. In short, when we claim that time has a beginning, whatever is generated of it [i.e., its parts] must be finite in quantity, even if it is indefinitely augmentable. Accordingly, it is evident from this argument that time must have a beginning.⁵¹

We can prove the impossibility of infinite past time in yet [another way]. Time is a measure of actual motion as the latter is progressively generated¹¹. Thus, it measures motion as a whole in so far as motion is a

⁵⁰Aristotle, *Physics*, IV:11.

⁵¹C. Touati, *La Pensée*, 230.

unitary continuous magnitude. But a measure qua measure must be finite, since an infinite has no measure or limit. Accordingly, in so far as time serves as a measure of actual motion, i.e., past time, it must be finite. Hence, time has a beginning.

Again, we can demonstrate the impossibility of infinite past time as follows. If past time were alleged to be infinite, this could not be conceived [in the following way]: that in past time there was some temporal interval and *after*^{m1} it [another] such interval, and after it [another] interval *ad infinitum*. For in this mode [of conception] that which is generated of the quantity of time would be always finite.⁵² Rather, [one could conceive of the infinity of past time] if one were to claim that before this temporal interval there is another interval and *before* the latter still another *ad infinitum*. But if this were so, the generation of past time would be from its anterior [i.e., earlier] side, which is absurd; for potentiality in time is, on the contrary, from its posterior [i.e., later], not anterior, side.⁵³

Furthermore, if this were true [i.e., the claim that past time is infinite], the time that is intermediate, which serves as the terminus a quo for the transition from finite time into infinite time, would be neither finite nor infinite. And this is absurd. In addition, the claim that an infinite can be generated from a finite [quantity] that is continuous with and prior to it is completely absurd. For, just as in the division of [a magnitude] that which has no extension is not generated from that which has extension, since the divisible always preserves the nature of being extended, so in addition that which is infinite in extension cannot be generated from that which is extended, since it is impossible for that which is extended to measure the infinite and for the infinite to be generated from the finite by continuous and successive [increases]. This is analogous to the point:

⁵²The defender of the infinitude of past time might think that he could prove his thesis if he were to argue from the progressively generating nature of time, since such a feature suggests limitless augmentation. Gersonides blocks this move by two-pronged argument, the first prong of which stops this move before it can get started: the defender of the infinity of past time cannot construe his argument such that the progressive generation of time takes place by continuous increments from some interval in the past to the present. For all such intervals would then be finite, and their sum would be finite: for the present moment serves as a *terminus ad qitem*, or limit, for every such interval. In the next sentence Gersonides will present the second prong of his refutation of this argument. (For a recent discussion of some

of these issues see Richard Sorabji, *Time, Creation, and the Continuum*, chap. 14).

⁵³One might conceive of time being open-ended, or infinite, as it is progressively generated toward its anterior side, i.e., in a backwards direction, from, the present. But this thought-experiment explodes when one realizes that on this view time would be moving or be generated *backwards*! Yet we all believe that if time "flows" at all, it does so in a forwards direction. Any openness in time is then in the future (Gersonides, *The Wars of the Lord*, Bk. 6, pt. 1, chap. 10).

-296-

just as the point cannot measure a line and the line cannot be generated from a point by continuous and successive [increases] -- for, just as the point does not cease being a point no matter how much it is multiplied -- since only an indivisible entity can be generated from it -- so too an extended thing does not cease being extended while it is multiplied, since it is always finite in [each and every] addition, as has been explained.

Again, if past time were infinite, it would be more correct to attribute infinite quantity to it from its later aspect [i.e., its future direction]. For this aspect is that part of time which is completely potential; and whatever is infinite is [infinite] in so far as it is potential, not actual. In general, since an infinite capacity exists in time only by virtue of the later aspect (as we have indicated), since the earlier in time is not generated after the later, it is clear that it is more appropriate for time to be infinite in quantity in its later aspect than in its earlier aspect. But it is impossible for it to be infinite in quantity in its later aspect, even if we generate the latter at any point we wish in past time. Rather, that which results from this ⁿ¹ [procedure] is always *ad infinitum* a finite [quantity]. Now, since that which would be more appropriately infinite in time, i.e., the later ^{o1} aspect, *cannot* be infinite, all the more so is it impossible for past time to be infinite in quantity.

Again, I say that past time cannot be infinite. If it could, there would be an eternal moving body moving eternally with continuous motion; for rectilinear motions do not possess continuous and eternal time, as Aristotle has shown. ⁵⁴Now if there is such an eternal moving body, it would move in circular motion; for continuous motion cannot be achieved in rectilinear motion. If this is all true, such a moving body must be the heavenly body, since there is no other such body. It is also evident from the nature of time that it numbers the motion of the heavenly body with respect to before and after, as has been explained in the *Physics*, even though it would be possible to conceive of time in terms of one ^{p1} of the other kinds of motion; for the perfect concept of time in so far as it is one and continuous is achieved only when we relate it to the motion of the heavenly body. But it has been demonstrated from its very nature that the heavenly body is generated; hence past time must be finite.

One should not object that past time doesn't exist at all. ⁵⁵For the exis-

⁵⁴Aristotle, *Physics*, VIII: 8-9.

⁵⁵Since many of the difficulties that infect the eternity thesis stem from the notion that time is infinite in the past -- which notion Gersonides has argued is tantamount to the claim that there is an actual infinite -- in desperation the defender of the eternity thesis now suggests that past time does not exist at all, hence, it is neither infinite nor finite. Thus, none of these difficulties are relevant (Touati, *La Pensée*, 231).

-297-

tence of time is nothing but this [kind of] existence [i.e., as past], since it is impossible for any part of time to exist as a definite particular [i.e., as actual right now]. ⁵⁶Indeed, the existence possessed by the nearest part of past time [i.e., the portion of time that has just passed] is the same as the existence of past time as a whole. ⁵⁷Now, that time does exist is evident; for in time there is a *before* and an *after*, and these features cannot apply to something that is utterly devoid of being. Moreover, everyone describes time as either finite or infinite; but these attributes have meaning only if they apply to something [really] having magnitude. In addition, one says of time that it is great or small and long or short: these terms apply only to something [really] having magnitude. ⁵⁸

[Finally,] it is important to note that time is necessarily characterized by properties of number and magnitude: in the first case because it enumerates motion with respect to before and after; in the second case because it is continuous. Thus, one says of it "great" or "small" because it involves counting; one says of it "long" or "short" because it is continuous. Hence, it is indefinitely divisible, just as magnitude; and it is indefinitely augmentable, just as in numbers and magnitudes. But it is augmentable only from its later aspect, just like numbers. ⁵⁹We have now demonstrated that time is generated absolutely, [i.e., it has a *terminus a quo*], and this was our intention in this chapter.

⁵⁶We shouldn't deceive ourselves thinking that all we have to do to seize a bit of time is to point to or focus upon "the present moment." There really isn't such a thing. As soon as we stick out our finger or concentrate our gaze, "this moment" has disappeared into the past. Indeed, as Aristotle remarks, the now always ceases-to-be (Aristotle, *Physics*, IV:10, 218a 14). Moreover, the now is "sizeless", since it is just a limit, or boundary, and hence is not a real part of time (R. Sorabji, *Time, Creation, and the Continuum*, 8-9).

⁵⁷In chapter 10 Gersonides proved that time has actual existence, or reality, *as past time*. Clearly the future doesn't exist at all; it is utterly potential. The so-called present is only a conceptual construct, since we can never point to it and say, "Here it is; I got it." The present is the instant, the now, and the now is not a part of time (Aristotle, *Physics*, IV:10, 217b31-218a3). So if time has any reality at all, it can only be past time, whether it be the segment that has just "passed by" or the whole of it.

⁵⁸Aristotle, *Physics*, IV: 8, 215a 10. R. Sorabji, op. cit., 13.

⁵⁹Just as in the series of natural numbers we go on "forwards", 1, 2, 3, 4,..., so too in time.

CHAPTER XII

IT is also necessary to examine whether motion is created after not existing or whether it is eternal, as has been claimed by the defenders of the thesis of the eternity of the universe.

Now it would seem that the first two proofs for the beginning of time are also valid for motion. For motion is a quantity just like time, and it is also a feature of bodies, as is time. On the other hand, time is posterior to motion in this respect: it is motion that endows time with the nature of quantity by virtue of the before and after in motion, and time is a feature of bodies via the motion. Consequently, it is necessary that motion be created. For example, since motion is a quantity and all quantities are per se finite, it follows that motion is finite in quantity. Analogously, since motion is a feature of bodies and bodies and all their properties are finite in quantity, as has been demonstrated, it follows that motion is finite in quantity.

It is indeed evident that all the proofs for the generation of time are also valid for motion, when they are applied to the latter. For example, we claim that infinite past motion is impossible. For if it were possible, the number of rotations of a fast heavenly body would be infinite, as would be the number of rotations of a slower body; and since there would be no difference in the number of rotations of the fast or slow bodies, there would be no difference in their velocity, which is of course absurd. Moreover, since there is a difference in the compound motion of the lower planets ¹ because of their motion of anomaly such that they have retrograde motion when they reach 180° of their motion of anomaly ², it turns out that their rotations are counted from this aspect and from the various sub-lunar effects that derive from them in each of their four periods. And when it is clear that the rotations are counted in this way and that each number is necessarily finite, it is evident that the number of past ^a rotations is necessarily finite.

The impossibility of infinite past motion can be demonstrated in another way. If such ^b motion were possible, then the motion that would have resulted in the past from a lunar eclipse would also be infinite; and it would follow that the moon would be eclipsed infinitely in past time.

¹The lower planets are, in the Ptolemaic system, those planets between the sun and the earth: Venus and Mercury.

²Gersonides, *The Wars of the Lord*, Bk. 5, pt. 2, chaps. 7 and 9, question 10.

Similarly, all the absurdities previously demonstrated with respect to this type of argument would follow if motion were assumed to be infinite in the past. This point is not very difficult since it has been discussed before.

Again, we say that it is impossible for the quantity of past time to be infinite. For it is evident that each portion of motion in the past can be uniformly a *when* [i.e., a temporal locus], because of the time taken by the motion. Now since there is no infinite when, it is evident that there cannot be a part ^c of past motion such that its distance from a presently occurring motion is transversible by an infinitely large motion. But if past motion is assumed to be infinite, then the proportion between motion in which there is no when and the motion in which there is a when will be infinite. Yet it has been proven that ^d all the parts of past motion can be *uniformly* a temporal locus, which is inconsistent [with the assumption that motion is infinite in the past]. Hence, past time must be finite. ³

Moreover, we argue that since the quantity of motion is generated by virtue of its forward progression ^e, it follows that the quantity of motion increases as the motion continues to progress. But if past motion were infinite, this [progressive increase] would be impossible. Hence, motion has a beginning.

Furthermore, since whatever results from the completion of a motion is measured [temporally] according to its forward progression, and since it is evident that that which is measured is measured as a finite magnitude, it follows that past motion is finite in quantity.

Again, I argue that it is impossible for motion in the past to be infinite [as follows]: Such a hypothesis is conceivable only if we assume that before this [present] motion (which is finite) there was another finite motion, and so on *ad infinitum*. But if this were so, motion would be generated from its earlier aspect, which is absurd; the potentiality inherent in motion is always from its later, not its earlier aspect. Moreover, on this hypothesis the quantity of the motion that is intermediary between the quantity of the finite motion and the quantity of the infinite motion

is such that the negation of the two extremes would be true of it, i.e., it would be neither finite nor infinite, which is absurd. Furthermore, the thesis that an infinite magnitude can be generated from something finite [in so far as the parts] are continuous, one before the other, is absurd. For just as it is impossible for the division of a magnitude to yield something

³This argument parallels the argument from time in Chapter XI. In both cases, it is argued that the hypothesis of infinite time or motion constitutes a "break" in the homogeneous nature of time and motion, such that we can no longer describe either of them in terms of our ordinary temporal and kinetic language.

-300-

that is not a magnitude, since that which is divisible always preserves the definition of magnitude, so too the augmentation of a [finite] magnitude does not result in an unlimited magnitude. For a limited magnitude cannot measure an unlimited magnitude; nor is it possible for the latter to be generated continuously and successively from the former, just as it is impossible for a point to measure a line and for a line to be generated continuously and successively from a point. For, just as a point does not cease being a point no matter how much it is multiplied, since only an indivisible entity can be generated from it, similarly when a magnitude is multiplied indefinitely^f the resulting composite doesn't cease to be a magnitude. For it is always finite despite this augmentation, as has been demonstrated previously.

Similarly, I claim that it is impossible for motion in the past to be infinite in quantity; for if it were possible, it would be more appropriate for it to be infinite from its later aspect [i.e., its future direction], since this aspect of it exhibits complete potentiality. The infinite, if it were to exist, would exist potentially, as in the division of a continuous magnitude and in the augmentation of numbers. But it has been shown that it is impossible for it to be infinite from the later aspect, as was demonstrated in the case of time. Hence, past motion is not infinite in quantity.

Again, we argue that past motion cannot be infinite in quantity; for if past motion were infinite, there would have to be an eternal body that moves continuously [i.e., with circular motion]. For rectilinear motions cannot be eternal and continuous, as Aristotle has shown.⁴ Now if there is such a moving body, it should be the heavenly body, since no other body can have such continuous motion. But the heavenly body is not eternal, as we have demonstrated;⁵ thus past motion is finite in quantity.

Nor should someone say that past motion is non-existent, [and hence neither finite nor infinite]. The existence of motion is nothing else than this [kind] of existence [i.e., as past], for no part of motion exists in actuality [i.e., in the present]; since motion [i.e., each part of motion] vanishes as it is progressively generated. Nevertheless, it is necessarily amongst the class of natural existent things, as Aristotle has shown.⁶ If motion is among the class of existent things, it is more appropriate to consider it real by virtue of its past aspect than by virtue of its future aspect; for its future aspect is complete potentiality, whereas its past is in some sense actual. In this manner motion is the actualization of that

⁴Aristotle, *Physics*, VIII: 8-9.

⁵Gersonides, *The Wars of the World*, Bk. 6, pt. 1, chaps. 7-9.

⁶Aristotle, *Physics*, I:2.

which is potential qua potential; ⁷i.e., past motion is in some sense actual [i.e., real], although there is inherent in it the element of potentiality, as is evident from its definition. Moreover, the actualization resulting from motion is found either in the moving body itself, as in the case of qualitative change, quantitative change, or locomotion; or in some other thing for the sake of which the motion exists, as in the case of the motion in the millstones which grind the grain or the motion of the pen in writing a book or the motion of the heavenly bodies in perfecting terrestrial objects. Now it is necessary to ascribe existence to past motion in some sense by virtue of the actualization resulting from it either in the moving body [itself] or in something else; [in either case] the actualization exists in them in reality, being the effect that accrues to them from the motion. This is why we must consider past motion as having some kind of reality. And the reality possessed by the most proximate part of it [i.e., the interval just before the present] has the same kind of existence as all of motion; for motion is completely continuous and one, as is evident from the analysis we have given of time.

⁷Ibid., III:1, 201a 10-11.

CHAPTER XIII

IT is now proper to examine whether the uncovered [i.e., visible] part of the Earth, ¹is eternal or created, since it too is one of those things whose existence is continuous. For, if it were possible that this portion should vanish such that the whole earth would be covered by water, all terrestrial life born according to species would be destroyed, ²and it would not be possible for them to be re-generated according to natural law, for we find that men are generated by men, oxen by oxen, and date-trees by date-trees. Accordingly, it is obvious that if these species were destroyed, it would be impossible for [new] individuals of these species ^a to be generated naturally by means of the mixture of elements, as is evident to anyone who knows the sciences. Since it has been established that the uncovered portion of the Earth is a continuous thing, so long as the various species composed of the elements, which are generated on it, continue to exist, it is appropriate to ask whether it exhibits the properties of a created object or not.

Now it would seem that the emergence of this portion of the earth is for a purpose; on it these earthly existents are generated. [Moreover], the natures of the earthly element and of the aqueous element do not of themselves give rise to this portion; nor do the heavenly bodies, as will be shown shortly. Consequently, the emergence of the Earth already manifests the characteristics of a created substance: it exhibits a pur-

¹*Ha-heleq ha-nigleh me-ha-'aretz*. Literally, "the uncovered portion of the Earth", i.e., that part of Earth's surface on which people live, as distinct from the oceans and seas. Touati translates the phrase as "*l'émergence de la terre*," "the emergence of dry land" (Touati, *La Pensée*, 185).

²This belief, -- that since it is the nature of the element of water to surround the element earth and cover it completely, the emergence and appearance of dry-land is proof of divine intervention -- goes back at least to the treatise *On the Eternity of the World* traditionally (but not unanimously) attributed to Philo. In XXIII:117-119 of that work the author claims that if the earth did not have a beginning, there would be no visible part of it since it would be covered wholly by water; hence, the earth is not eternal. This general belief was widely held

throughout the Middle Ages. For the Arabic literature consult F. Dieterici, *Die Naturanschauung und Naturphilosophie der Araber in Zehnten Jahrhundert*, (Berlin, 1861), 58-60. For the Latin literature see P. Duhem, *Le Système du monde*, (Paris, 1958 reprint), vol. 9, chaps. 15-16. In the Jewish literature the idea is found in Jehudah Halevi, *The Kuzari*, V:10; Samuel ibn Tibbon, *Yiqqavu Ha-mayyim*, I:13; Isaac ben Joseph Israeli, *Yesod 'Olam*, II:2-3; Isaac Albalag, in G. Vajda, *Isaac Albalag: Averroïste Juif, Traducteur et Annotateur d'Al-Ghazali*, (Paris, 1960), 147-48; *idem.*, *Recherches sur La Philosophie et La Kabbale*, (Mouton: Paris, 1962), pt. 1, chap. 1.

-303-

pose; it has properties that do not follow from its nature alone, nor from the nature of that which emanates to it from the heavens; and it exists for something else. Hence, the emergence of the earth is created.

That the emergence of the earth has a purpose is indubitable. We find a great utility in it by virtue of the fact that the sub-lunar existents are generated on it. And whatever is of this sort ^b can not occur accidentally; for if it were by mere chance, they would be found only in limited regions of the earth and for only a short time.

That the elements of earth and water themselves are not responsible for this process is evident. For the essential nature of the water is to encompass the earth on all sides. That the nature of that which emanates from the heavenly bodies does not account for this phenomenon is also evident, as I shall now show. It is evident from sense-observation that the visible portion [of the Earth] is visible for no longer than twelve hours. ³ And this fact [people] in both eastern and western lands have established on the basis of the [evidence supplied by] lunar eclipses. Now it is obvious that whichever heavenly body which would [*ex hypothesi*] be responsible for this activity would make the earth visible for twenty-four hours [i.e., completely visible], [which is false]; for the activity that emanates from such a body or bodies in [any] one latitudinal [position] with respect to the earth is ^c uniform, as is obvious, especially in the light of our conclusions from Book 5. When all these facts are appreciated, it is evident that the visible portion of the earth is created. For it would be impossible to assert that its existence eternally emanates from its efficient cause. This is so for two reasons. [Firstly,] there is nothing to which we could attribute the eternal drying up of this part of the earth, as we have explained. [Secondly,] the visible part of the earth is higher than the other parts of the earth which ^d the aqueous element encompasses; otherwise, the water would be higher than this visible ^e part, which is false, as we can confirm by our senses and by scientific reasoning. For it would necessarily follow if this were the case, that the element of water would flow toward the visible part of the earth which is lower than it, as it is the

³The expressions "twelve hours" (*sha'ot*) and "twenty-four hours" in this context denote spacial, or geographical, regions i.e., half and the whole surface of the earth respectively, or 180 and 360 degrees of a circle or sphere (Gersonides, *Commentary on Proverbs*, 30:4; *Commentary on Genesis*, 12a; *Supercommentary on Averroes' Commentary on Aristotle's Meteorology*, I:14 (Second Treatise, Vatican #342, folio 253). Averroes, *Middle Commentary on Aristotle's Meteorology (Latin)*, 438-41).

Gersonides now wants to prove that the emergence of the visible, inhabitable part of the Earth, which is roughly half, 180 degrees, or "twelve hours" of the total Earth, cannot be caused by any natural process or agent, especially the stars. This latter view was advocated by Aristotle in his *Meteorology* I:14, II:2 and 5 and *On Generation and Corruption*, II:10, 336b 10 ff (Touati, *La Pensée*, 185-87, especially n.58). In his *Commentary on Proverbs*, 30:4

nature of water to flow to places lower than it. Now since it has been shown that the visible part of the earth is higher than any other part of the earth, it would clearly follow, if there were a cause which eternally generates it ^f, that the highest part of the visible portion of the earth would be eternally generated from nothing and destroyed into nothing at each instant. It would also follow that time would be composed of instants, as we have shown previously. ⁴ But since all these consequences are false, it follows that the emergence of the earth is created by an agent at the very beginning of its existence ^g, since its existence cannot emanate eternally from its agent, as we have demonstrated. Furthermore, the heavenly bodies preserve this part of the earth, as has been explained. Now, if we assume that this place [i.e., the visible portion of the earth] derives from an efficient cause and that its preservation only is attributable to something from ^h the heavenly bodies, the previous objection -why isn't the earth visible for twenty-four hours [i.e., entirely] -- obviously cannot arise. ⁵

It has therefore been demonstrated by these three modes of argument that the visible part of the earth is created. But if this part is created, it is obvious that the whole world is created. For if we were to assume that the heavenly bodies and the four elements were eternal, it would be possible for this part [of the earth] to be visible for infinite time. But this is obviously absurd. In addition, it would be absurd to claim that the heavenly bodies have the instruments to influence the sub-lunar domain and yet no influence has been exerted throughout infinite [past] time, and [hence] their motion would be in vain; for their motion is for the purpose of influencing the sub-lunar domain, as has been explained. This [hypothesis] is utterly absurd, i.e., that the motion of these noble bodies can be in vain for infinite time. Consequently, the whole universe is created.

It should be noted that Aristotle himself seemed to have realized this point, and therefore he attempted to explain this phenomenon by natural causes. He claimed that the cause in question here is the heat of the sun in this place [on the Earth]; for it is the nature of heat to dry the moist. ⁶ But it can be shown that the existence of the visible part of the earth cannot be explained in this way. The heat of the sun is also dominant in the southern hemisphere of the Earth, just as it is in the north, or even more dominant because of the sun's eccentric orbit. Hence, if Aristotle's theory were correct, the southern part of the Earth should

⁴Gersonides, *The Wars of the Lord*, Bk. 6, pt. 1, chap. 7.

⁵For God voluntarily created the world in *this particular way*.

⁶Aristotle, *Meteorologica*, II:2, 4-5.

also be visible; ⁷[indeed,] it would follow that the whole earth would be visible except for two parts, in the North and South. ⁸ But this is false on both empirical and theoretical grounds. On empirical grounds this is false because no more than half of the Earth is observed as being visible. On the theoretical grounds it is [also] false, as Averroes has claimed. For, if this hypothesis were correct, there would not be a [definite] proportion between the element of water and [any] one of the other elements and it would be fitting for the element [i.e., fire] that is contrary to this element [i.e., water] over-power ⁱ and destroy it, as is the case with every contrary: it destroys its contrary when it over-powers this contrary. ⁹ Therefore, Averroes adds another factor to explain this fact along with the reason of Aristotle: the multitude of stars in the northern hemisphere, which is the inhabitable part of the Earth. Averroes says that in addition to

the heat of the sun there is the heat of the stars in the northern hemisphere; and it is a known fact that there are more stars in the northern hemisphere than in the southern hemisphere, which number has been attested to by the astronomers. Hence, he concludes that the southern hemisphere is not visible, [i.e., inhabitable], even if the sun's heat is greater there. ¹⁰But [again], if Averroes' account were true, it would also follow that the visible part of the^j Earth should be visible for twenty-four hours [i.e., the whole Earth should be visible]. But this is false. ¹¹

¹⁰Averroes resolves the problem as follows. The heat of the sun is not the sole or the most important factor in accounting for the fact that it is the northern part of the earth that is the more inhabitable region of the earth, since the sun heats up the southern hemisphere as well, perhaps even more so. What is crucial is the heating effect of the many stars located in the northern hemisphere. Indeed, the relative paucity of such stars in the southern hemisphere explains why it is uninhabitable (Ibid., 439L).

¹¹For the same reason as given earlier in this chapter: the motions of any of the heavenly bodies influence both the northern and the southern hemispheres; hence, the heating of the stars would also be felt in the southern hemisphere, and at least some part of that region should be visible and inhabitable. Gersonides' comments on Proverbs 30:4 are particularly pertinent here.

⁷According to the medieval Aristotelian tradition the northern hemisphere is more visible and thus more inhabitable than the southern hemisphere, where, according to Isaac ben Joseph Israeli, deserts and water abound (Isaac ben Joseph Israeli, *Yesod 'Olam II*. Duhem, op.cit., 162-63).

⁸*The North and South Poles* (Touati, p. 186).

⁹Gersonides seems to be referring to the following argument found in Averroes' commentary on the *Meteorologica*:

"Nam sicut invenitur in parte septentrionali propter frigiditatem, ita oportet ut sit in parte meridionali propter caliditatem. Et hoc sequitur ex sermone universali, qui est quod, cum invenitur unum contrarium in fine, seu in extremo, oportet ut sit reliquum contrarium in illo fine...Et conveniens est ut unum contrariorum corrumpat reliquum..." ("For just as it is in the northern hemisphere because of the coldness [there], so it is necessary that it be in the southern hemisphere because of the heat. This follows from the general principle, i.e., whenever one contrary exists in its extreme, it is necessary that the other contrary be in its extreme...And it is appropriate that one of [a pair] of contraries destroy the other.") (op. cit., 439 C-D). The destruction of one element, which would be entailed by Aristotle's hypothesis, would upset the equilibrium amongst the elements, and consequently lead to the destruction of the earth.

A further difficulty is relevant to their explanation. It is evident that the thermal ossification that is alleged to account for the visible portion of the Earth is not sufficient [as an explanation]. For it should follow from this theory that the earthly^k element should emanate from the heat and should continually make the visible portion higher than the other parts of the Earth. But the generation of the earthly element is not attributable to heat but to cold, as is evident to anyone familiar with the sciences. ¹²Now if someone were to object that the cold derives from the brightness of the stars, the preceding difficulty can be brought forward, i.e., it would follow [from their uniform illumination] that the visible portion of the Earth should be visible for twenty-four hours, [i.e., the whole Earth should be visible]. It has now been demonstrated without any doubt that the visible portion of the Earth cannot be explained either by natures of the earthly and aqueous elements or by emanations to them from the heavenly bodies by means of their rays. Thus, the visible portion of the Earth is created.

But now a difficult problem raises its head. It would seem to follow from this that things here below also should be generated absolutely, [i.e., at a definite moment]. Hence, it would be difficult to explain how species are in fact generated from their respective species; for if it is assumed that they are generated absolutely, it would follow that the cause of their generation is not [a member of the respective] species ¹³. But this is obviously false, as anyone familiar with sciences knows.

Now it has been previously shown ¹⁴ that it is not proper to make inferences from what is true of particular generation to universal generation. For in particular generations there must be a whole preceding the part that is being generated; but this is not necessary in the latter. Moreover, it has already been demonstrated from the generation of the heavens that this universal generation is attributable to will and choice, not to nature. Consequently, it is possible for the heavenly bodies to be of one common nature but have different forms. Now if this is possible in the case of the celestial bodies where their differences do not derive from their nature, all the more so is it possible for sub-lunar bodies to be different in nature by virtue of the different proportions that occur

¹²Aristotle, *On Generation and Corruption*, II:4.

¹³If the visible part of the Earth has an absolute beginning, then the individuals in each terrestrial species should also have an absolute beginning. Just as in the former case the generating cause is God, so in the latter the generating causes are not other members of the same species but God.

¹⁴Gersonides, *The Wars of the Lord*, Bk. 6, pt. 1, chap. 4.

-307-

amongst the elements from which they are composed by mixing and blending. In this way the objection has been answered. From this it has been also proved that the generation whose source is will and choice is prior to that generation whose source is nature. In creating the species God endows each of them with the principle of reproduction ^l according to species, so that each species is preserved [qua species] as far as possible. For since it is impossible for individuals of the species to be preserved ^m, the preservation of the species has been prepared in this manner ¹⁵. Praise be the Creator of the universe, the perfection of whose ⁿ power and wisdom cannot be fathomed!

¹⁵The generation of individuals within a species is not absolute, although the generation of the whole inhabitable Earth is. The latter is directly attributable to divine will, and is a case of "total generation". The former is only "partial generation" and only indirectly attributable to divine will and more properly attributable to natural causes that are traceable to the biological structure of each species.

-308-

CHAPTER XIV

SINCE we have previously mentioned ¹ John the Grammarian's [i.e., John Philoponus] attempt to prove from Aristotle's own words that the universe is created, it is fitting that we now examine this argument to see if it is valid.

It would seem that Aristotle has demonstrated the impossibility of an infinite ²power, [or force], residing in a finite body. Accordingly, if the heavenly bodies are admitted to be finite [in size], it is evident that given the previous principle, a heavenly body cannot have infinite power. Thus, Philoponus concludes, the heavenly bodies must be destructible and their motions must cease. ³

The sage Averroes attempts to remove this difficulty by suggesting that the only potentiality possessed by the celestial bodies is the potentiality for locomotion. ⁴For this reason they are not necessarily destruc-

¹Gersonides, *The Wars of the Lord*, Bk. 6, pt. 1, chap. 3.

²*Koah*; *quwwa*. In medieval philosophical Hebrew this word is used to render Aristotle's δύναμις, which in Aristotle has a variety of technical connotations. The basic meaning is that of the power, or capacity, a thing has to perform some activity or to undergo some change. When the act is done or the change realized this power has been actualized. In this sense it can be rendered as a *potentiality* for some act or change. An infant, for example, has the potentiality, power or capacity for speech. When the child speaks, this potentiality, power, or capacity has become an *actuality* (U=1F00ντελεχU=1F77α). Aristotle, *Metaphysics*, V:12; IX:1-5; *On the Soul*, II:1). Aristotle also uses this term to express the concept of force, or energy. Here the term assumes a quantitative-physical connotation, indicating the amount of power a thing has to do something: a body has a specific amount of heating capacity, or energy. Finally, in some contexts ἔντελεχία can mean for Aristotle *possibility* (Aristotle, *Metaphysics*, V:12, 1019b 21 ff). We shall soon see that Gersonides will use another Hebrew word for this last sense: 'efsharut (see note 5).

³Aristotle, *Physics*, VIII:10; *On the Heavens*, I:5-7. Philoponus, *De Aeternitate Mundi*, ed., Rabe (Leipzig, 1899), 7. Averroes, *Commentarium de physico auditu*, (Venice, 1562), Book VIII, 426 H-M; *Commentarium de libriis metaphysicorum*, 324 B; *Commentarium de libriis De caelo*, II, 145 G-M. Saadia Gaon, *Book of Beliefs and Opinions*, Book I, c.1. H. Wolfson, "The Kalam Arguments For Creation in Saadia, Averroes, Maimonides, and St. Thomas," *American Academy For Jewish Research, Texts and Studies*, II (New York, 1943), 3-7. S. Sambursky, *The Physical World of Late Antiquity*, (New York, 1962), 146-66. H. Davidson, "John Philoponus as a source of medieval Islamic and Jewish proofs of creation," *Journal of the American Oriental Society*, 89 (1969), 357-91; *idem*, "The principle that a finite body can contain only finite power", in S. Stein and R. Loewe, eds., *Studies in Jewish Religious and Intellectual History Presented to Alexander Altmann*, (Alabama, 1979) 75-92.

⁴In this argument the term *Koah* (δύναμις) has both the connotations of *potentiality*, i.e., what a particular thing is capable of doing or undergoing, and of *power*, or *force*, i.e., the amount of energy a body possesses or can exert (H. Wolfson, *Crescas' Critique of Aristotle*, 681-82, where citations from Averroes' commentaries on Aristotle's *Metaphysics* and *On the Heavens* are given).

tible, although in and of themselves it would be necessary for their motions to end. [Nevertheless,] their motion is continuous and eternal because of the infinite power of their separate movers. According to Averroes this is possible in motion, since motion is a feature of a moving body that derives from the mover. Therefore, the motion is possible [i.e., contingent] with respect to the nature of the moving body but eternal with respect to its cause, which is separate. Hence, the potentiality [for motion] is infinite.

Now if this be the case, i.e., the possibility ⁵in the heavenly bodies for motion is finite, fatigue would accrue to the moving body after it reaches its maximum limit of motion; and thus its

motion should naturally cease, since cessation of motion necessarily occurs as the result of the ensuing fatigue, not ^a from the power of the mover. For example, in the case of a musician the movements of his limbs are caused by the song conceived in his mind; and after a certain amount of these movements persist, the limbs begin to suffer fatigue and weariness, although the mover remains the same, i.e., the conception he has of the song. It would follow from this that his motion should cease, unless by God we were to hold that the mover forces them to move in the way that one body moves another ^b by contact, which is absurd. ⁶ It is also evident that if we assume the motion [of the heavenly bodies] to be of this sort, these heavenly movements would always be intrinsically impossible although necessary because of their cause; hence, their motion would be eternally constrained. For, if past time is alleged to be infinite, then any [finite] portion of motion that a heavenly ^c body has is preceded by a motion that is infinitely greater than the motion that it may intrinsically have. Thus, any motion the heavenly body has would be constrained and forced, since it would not have the intrinsic possibility for such motion. But this is absurd, since among natural phenomena we do not find such a thing; all the more so is it impossible for such a thing to be continuous [or eternal]. ⁷

⁵Here Gersonides uses the term '*efsharut*', "possibility" (*imkan*). This term too translates Aristotle's Greek *δύνασις*. But the latter now is opposed to impossible (*ἀδύνατον*) in some contexts or to the necessary (*ἀναγκαῖον*) in other contexts. Strictly speaking, then, the word '*efsharut*' is a term of logic and should be rendered as "possible". But Gersonides' usage is not that strict: here he uses '*efsharut*' but he construes it as *Koah*, capacity, or power (Wolfson, *Crescas' Critique*, 690-92. Touati, *La Pensée*, 239-42).

⁶This is not the way in which the song moves the musician.

⁷On Averroes' hypothesis the continuous and eternal motion of the heavenly bodies is intrinsically, or essentially, impossible, although they have this motion by virtue of some extrinsic cause, and hence such motion would be "forced", or constrained. But if this is the case, any given finite segment of motion is equally *unnatural*, or forced. Moreover, according to Aristotle forced motion is always of short duration because of its unnaturalness (*On the Heavens*, I:2). Let such a portion of motion be A. Then A has been preceded by a motion that, because it is infinite, is unnatural to it. But then A itself is unnatural!

Moreover, the motion of a heavenly body occurs by means of conception and apprehension, as has been explained. ⁸ Hence, their movers do not move ^d them by constraint but by choice and desire. Accordingly, the power of the mover does not make their motions eternal; rather, their desire and choice to move according to what their conceptions necessitate make their motions eternal. Now if it is assumed that their possibility for motion is intrinsically finite, it should follow that their motion would cease ^e. For we can see it is generally the case that the powers that derive from the moving forms are not responsible for the cessation ^f of motion; rather the moving body is responsible [for the cessation]. For example, the soul, which is the moving [power] in man, is always in the same state, but its motive force ceases because of the weakness of its organs, not because of the termination of its [own] power ^g; for it is possible that its power ^h be the same as it was ⁱ when it moved [the body], and yet it ceases moving the body. It is therefore clear that the cessation of motion is due to the body that is moved, not to the mover. So we have not gained ^j anything at all in trying to remove this difficulty by assuming that the mover is not a power in the body, [as Averroes suggested].

It will now be shown that Aristotle himself believed that it might be possible for fatigue to occur in the heavenly bodies. In explaining why the uppermost sphere has many bodies [i.e., the stars], whereas the lower spheres have only one body each [i.e., a planet], Aristotle suggests that if the

lower spheres were to have many bodies the uppermost sphere would suffer fatigue in moving them. ⁹ Now, if it is not ^k the nature of circular motion, which is natural to the spheres, to give rise to fatigue, I do not know how it happens in this case that the uppermost sphere suffers fatigue! It is all the more [puzzling] because of Averroes' interpretation of the diurnal motion of the other spheres which are moved by it [i.e., by the uppermost sphere] by means of desire and choice. For if this interpretation is true, it is inconceivable that the uppermost sphere could suffer fatigue by virtue of this fact; since the object of desire does not suffer fatigue when other things are ^l moved by it. On the contrary, fatigue attaches to the *moving body*, [not to the mover].

We have previously discussed [the merit of] Aristotle's explanation of this difficult problem; ¹⁰ however, we have mentioned it here in order to

¹⁰Gersonides, *The Wars of the Lord*, Bk. 6, pt. 1, chap. 9.

⁸Gersonides, *The Wars of the Lord*, Bk. 5, pt. 3, chap. 6.

⁹Aristotle, *On the Heavens*, II:12. Averroes, *Commentary on On the Heavens*, II, 145G (Latin).

-311-

show that Aristotle does not consider absurd that it is impossible ¹¹ for the heavenly bodies to suffer fatigue in their circular motion. Indeed, it is possible to show that this assertion [i.e., fatigue in the heavenly domain] is a consequence of his very thesis. For if we were to assume that if the solar sphere, for example, had two heavenly bodies and that the uppermost sphere would suffer fatigue in moving the solar sphere, then this fatigue must be such that either the [uppermost sphere] could still move the solar sphere for a certain time or it could not move the latter at all. Now, if we assume that it could move the sphere of the sun for a certain time and afterwards it would cease moving because of fatigue, it is clear from what is said in the *Physics* on this topic that the uppermost sphere could move the solar sphere, if the latter had only *one* body, for a longer period of time [than if it had two bodies], according ^m to the ratio of one moving body to another moving body. Thus, the moving force of the uppermost sphere upon the other spheres below it would necessarily cease. ¹²

But if we say that the fatigue is such that the uppermost sphere cannot move [anything else] at all, it is evident that it follows from this that this sphere would not be able to move the solar sphere even if the latter were assumed to have only *one* body, not even for a shorter period of

¹¹Gersonides' language here is a bit confusing. Since all the manuscripts consulted and the printed editions are unanimous, the text is translated here as it stands. Gersonides' point is this. Although Aristotle's conclusion is that the heavenly bodies do not in fact suffer fatigue (*Metaphysics IX:8*, 1050b 22; *On the Heavens*, I:2, 269b 7-91), nevertheless his discussion of this question implies that he thought it was logically possible for them to suffer fatigue. Gersonides' phrasing in this passage is tricky: he asserts that Aristotle did not deny the impossibility of celestial fatigue. This wording appears to rule out the possibility of fatigue; but it really doesn't. Let "p" be the sentence "The heavenly bodies can suffer fatigue". Gersonides asserts in the name of Aristotle: "It is possible that p is impossible." Let this be designated by "q". "q" is logically compatible with "p": even though it may turn out that fatigue cannot accrue to the celestial bodies, it is not a logical absurdity.

¹²According to Aristotle's law of proportions in moving bodies, if a mover A can move B distance C during time D, then A would be able to move 1/2 B distance C in 1/2 D, or 2C in D. Now, in explaining why the outermost sphere, i.e., the sphere of the fixed stars, has many bodies but only one simple motion whereas the lower, or planetary, spheres have only one

body but many motions, Aristotle suggests that if the lower spheres had more than one body each, the outermost sphere would be subject to fatigue, as the above law implies. This fatigue, or weakness, can assume either of two forms: (1) either the mover moves the body for some finite interval of time but then stops because of the fatigue; or (2) the mover doesn't move the body at all since it is "too heavy to budge an inch". Now in the first case, the less "heavy" the object is, the greater the distance or the longer the time will be that the mover will be able to move it. But in each and every case, the ratios will be finite. And since every mover has only finite force, its "kinetic energy" will always yield a finite result, i.e., no matter how great this force is, the time that it will be able to move another body will be finite. Sooner or later the body will cease moving (Aristotle, *Physics*, VII:5; *On the Heavens*, II:12, 293a 5-12).

-312-

time than it could have on the first hypothesis. For example, someone who can move four weights for a half-hour can move two weights longer than someone who cannot move four weights at all, [i.e., the latter might not be able to move at all even two weights]. The proportion of times is analogous to the proportion of capacities. But if we admit that fatigue suffered by a moving body does not cause the cessation of motion because the mover preserves the motion continuously by virtue of its infinite power, [i.e., as Averroes claims], what, I wonder, is the point of Aristotle's explanation in this context? For, although the uppermost sphere could suffer fatigue, it would not cease moving; and if it itself does not cease moving, it would not cease moving [another sphere]. It has been therefore demonstrated that Aristotle's own theory entails that the motion of the heavenly bodies will cease, as John the Grammarian maintains.

Nevertheless, when we examine this issue as such, we do not find that it yields a proof for creation of the world [as John had claimed]. We have already shown that it is not impossible for a finite body to have an infinite capacity for moving something else so long as the body that is being moved does not have a nature that is opposed to this kind of motion [and] so long as the proportion between the mover and the moved is preservedⁿ. ¹³ And so it is evident that it is possible for the motion of the heavenly bodies not to cease; for they do not have a nature that is opposed to the motion they have and the proportion between the mover and the moved is always uniform, since they are not bodies having any mixtures or contraries. This is what we intended to prove in this chapter. ¹⁴

¹³Gersonides, *The Wars of the Lord*, Bk. 5, pt. 3, chap. 6.

¹⁴Richard Sorabji has given an excellent historical and philosophical analysis of this problem in his *Matter, Space, and Motion* (Ithaca, 1988), chap. 15.

-313-

CHAPTER XV

WE find additional evidence and confirmation for the creation of the universe in that whatever has been written in the sciences is of recent vintage. For we find that the early investigators say certain things in a particular science, which were subsequently improved upon; such that in one science perfection was achieved only with Aristotle, whereas in another science perfection was attained only with Galen. Yet another science has not been perfected by any of the ancients, i.e., astronomy. Thus, the science that requires more time for its perfection because of empirical prerequisites attains perfection much later. The mathematical studies, e.g., geometry and arithmetic, are more ancient^a than the other sciences; for among Aristotle's predecessors there were [mathematicians] who formulated perfect [mathematical] propositions, as it would seem from

what has been related of them. But in the natural sciences, which have greater need of sense perception, perfection was achieved later. Consider medicine, which requires considerable empirical information, in particular knowledge gained from experience and dissection. Its perfection has therefore been later. Indeed, in astronomy, where empirical data have to be accumulated over a very long period of time, perfection has [even] been later. Now since these sciences constitute human perfection such that man naturally pursues them, it is impossible to say that the human species is eternal [and the world is eternal] and [at the same time] that these sciences have been recently created among them^b. For if this were the case, there would be a possibility that is realized only in infinite time, although the means and a strong natural desire were present to realize this capacity. But this is absurd.¹

This point is confirmed by the situation of the Torah, which has now spread throughout all the nations; [for] it is of [relatively] recent origin. But if the universe were eternal, the revelation of the Torah should have been much^c earlier [than its actual occurrence]; indeed, it would have been proper^d for the Torah to have been in existence for all of past infinite time. The situation here is similar to that of the sciences: the laws before the Torah were very imperfect, until this most perfect divine law was revealed, as is obvious to anyone familiar with its content. We have

¹Plato, *Laws*, III, 676-77. Philo, *De aeternitate mundi*, par. 130, 145-50. Wolfson, "Patristic Arguments Against the Eternity of the World," *Harvard Theological Review*, 59 (1966), 356-59. Thomas Aquinas, *Summa Theologiae*, I, q.46, a.2, Obj. 4.

just given a preliminary explanation of this point so that there will be no doubt to anyone interested in speculation; indeed we have discussed this in [the Introduction to] our commentary on the Torah.

This same point can be illustrated when we consider [human] languages. It would seem that languages are conventional, not natural.² If they were natural, like the neighing of a horse or the braying of an ass, either of two consequences would result: either the human race would be distinguished by species according to languages; or languages would differ according to climatic [i.e., geographical] conditions. It is evident, however, that the human race is not distinguished into species according to the differences amongst languages. For on this hypothesis it would follow that a man could not learn a new language and lose his original language, which would be a unique feature of his race. But this is empirically false. For we see men of a particular language dwelling amongst people of a different language and their children speak the latter language but do not know the language of their parents. It is equally false that languages differ according to climates. For it would follow from this hypothesis that everyone would naturally speak the language of a particular climate when he came there. Moreover, it should also be the case [on this hypothesis] that the [relative] speed and slowness in language be a function of various climates and not the effect of the particular letters constituting the nouns and verbs. Hence, it is evident that language is not natural but conventional.³

It is also evident that those who institute the linguistic conventions preceded the language itself. Even if they had a language prior to this particular language, the preceding point would still be true, i.e., that language is conventional and those who institute it precede it. Nor is there any reason to say that there has existed an infinite number of languages each preceding the other. For, since it has been proven that language is conventional, it is not possible for the members of a nation to agree to change their language; for there could not be a [sufficient] reason why they would do so. And it would be quite improper to say that they agreed to do so without any reason,

especially for an infinite number of changes of language. Moreover, we have no empirical data from what we know about the long history of languages that supports the hypothesis that people agree to change their language, i.e., they drop one language and adopt another. All the more so would it be unseemly because of the loss that would occur to the nation by this action. Since it is incumbent upon the wise men in each generation to write books in the sciences and

²Wolfson, *Religious Philosophy: A Group of Essays*, (New York, 1965), 223-37.

³Aristotle, *On Interpretation*, 2; 16a 19. Halevi, *Kuzari*, I: 53-54 (Commentaries ' *Otzar Nehmad and Qol Yehudah, ad locum*). Maimonides, *Guide*, II:30.

-315-

in laws to perfect imperfect creatures and to guide them towards happiness, there is no doubt that a society at large would not agree to drop its language so as to prevent the good in these books from passing on to succeeding generations. Consequently, it is evident that it is fitting^e that no other language preceded these languages, and that they are necessarily created as we have seen.

Now it is clear that the human species requires language to preserve its existence, both individually and collectively, for whatever time is possible, since man is political by nature. That which they need to survive is achieved only through many [kinds] of crafts and skills; and hence the people of a state need a language so that they can express their needs for their bodily preservation and for their human [i.e., intellectual] perfection, as far as is possible. Hence, it is unlikely that the human race would be bereft of a language for infinite time; and so it is necessary that the human race precede the existence of language by a finite interval of time. But whatever precedes by a finite interval something that is itself created [i.e., language] is necessarily created; hence the human race is created.⁴

It should be realized that Aristotle himself had some awareness of this whole point; for in the *Meteorologica* he says that it is possible for dry land to become water and conversely; thus, languages and scripts could change, and it would be possible for books to exist and yet no one would be capable of reading them.⁵ For this reason Aristotle also believed that human knowledge is regenerated successively throughout infinite time, as he explicitly says in the *Metaphysics* and in his scientific writings.⁶ Nevertheless, [this cyclical theory of civilization] is of no use^f [in refuting]

⁴Gersonides has already demonstrated that language had a beginning. Now he proves that the human species too had a beginning. The major premise of this argument is: if X precedes Y by some finite interval T and Y has a beginning, then X too has a beginning. For example, if Reuben is exactly one year older than Simon and Simon was born on January 1, 1000 B.C.E., then Reuben was *born* on January 1, 1001 B.C.E. Hence, if languages precede the human species by some finite interval, no matter how large, and if languages themselves were instituted at some *definite* time, then the human species too had a beginning. This particular argument is a specific version of the more general principle that if two things are related to each other by some definite, or finite, magnitude, they must be finite.

⁵Aristotle, *Meteorologica*, I:14, 351a1q ff, 351b11 ff. Gersonides, *Supercommentary on Averroes' Commentary on Aristotle's Meteorologica*, Book II.

⁶Aristotle admitted that the sciences are of recent origin, but he claimed that they are successively re-created *ad infinitum*. Thus, this theory of cyclical civilization would be compatible with Aristotle's doctrine of the eternity of the universe. Gersonides will, however, now argue that this theory of the sciences is inadequate; indeed, he will claim that certain

aspects of this theory actually support the thesis of creation of the world (Aristotle, *Metaphysics*, XII:8, 1074b 11-14; *Meteorologica*, I:3, 339b 28-30; *On the Heavens*, I:3, 270b 19-20; *Politics*, VII:10, 1329b 24-26. C. Touati, *La Pensée*, 191-92).

-316-

the proof for creation of the world that we have derived from these phenomena. For it is very unlikely that a particular ^g nation would be destroyed in this way all at once. Moreover, if it were so destroyed, a new language would not be generated thereby. And if the nation were not completely destroyed, the survivors would necessarily speak the original language. Or, if a people were exiled amongst people ^h of a different language, the next generation of the exiled people would speak this language, but no new language would emerge. Furthermore, on Aristotle's hypothesis the number of languages should continuously decrease, and ultimately one language alone would be left throughout infinite time. ⁷ But this is false. Also, it would follow [from this hypothesis] that the surviving languages would be generated and that the originators of these languages would have existed before ⁱ them for a *finite* interval. But this means that the human race would be absolutely generated, [i.e., has a temporal origin]. For Aristotle's claim obviously concerns the destruction of languages, not their origin. This can also be seen in the case of the sciences. For if we admit that languages disappear, the remaining languages would precede ^j the wisdom contained therein by a finite interval, even if it is admitted that some languages have disappeared and the wisdom contained in them also vanished. Moreover, it does not follow from the disappearance of a language that the wisdom written in that language also vanishes. For we see in sciences which have been perfected and disseminated throughout the nations e.g., the wisdom of Aristotle and Galen, Ptolemy in astronomy and our own perfect Torah, etc., that it is not possible for these sciences to disappear unless the whole human race vanishes. Now this is the case because there is in man a natural desire to attain wisdom since it is his perfection and happiness; [hence], men try to translate these various sciences into their own languages. And so these sciences are disseminated in this manner throughout all languages. Accordingly, these different things mentioned in this chapter constitute strong evidence in favor of the creation of the world. And this is one of the characteristics of the truth: it is self-consistent in every respect.

⁷Since the number of nations would steadily decrease, so too the number of languages will diminish.

-317-

CHAPTER XVI

AFTER having demonstrated from all these things that the universe is created, it is now proper to examine whether or not the universe is subject to destruction. ¹ For this purpose let us first inquire into the causes of destruction. Natural destruction results from the matter of a natural substance, not from the form. For the form tries to preserve in existence that of which it is the form as long as possible, as has been shown in the sciences. When destruction does occur it is the effect of the predominance of the passive powers over the active powers in those things that have contrary elements or are composed of them; for it is the nature of a contrary to destroy its contrary. ²

Accordingly, since it is evident that the heavenly bodies do not have any contraries nor are they composed out of them, it is clear that they are not destructible; for they do not possess any of the material causes of destruction. And it is not the nature of the form to be a [cause of] destruction;

rather, it endows the thing, of which it is the form, with whatever goodness and perfection it may have. Now, since the heavenly bodies are indestructible, it is evident that the universe [*in toto*] is indestructible. For the heavenly bodies emanate ^a whatever is needed for the perfection of sub-lunar generations as long as they exist. Hence, this sublunar world is also indestructible.

It might be objected that from this proof it follows only that the universe is not naturally destructible, since it has no natural causes of destruction and whatever has no [natural] causes of destruction is [naturally]

¹The question of the destructibility of the universe is a venerable one in the history of cosmology. Plato and Aristotle both denied it; but whereas Plato believed that the world lasts forever because of divine will, Aristotle maintained that the world is incorruptible as well as ungenerated (Plato, *Timaeus*, 41 A-D. Aristotle, *On The Heavens*, I:3, 270a 13ff and I:10-12. Philo, *On the indestructibility of the universe*). On the other hand both Stoics and Epicureans believed in cosmic destructibility: the former asserting a series of successive generations and destructions, the latter advocating random generations and destructions.

With the promulgation of the Condemnation of 219 Propositions in 1277 by the Bishop of Paris Stephen Tempier, this topic became an important issue in late medieval scholastic philosophy. It was felt that the Aristotelian thesis of cosmic indestructibility impugns divine omnipotence. Hence, the Bishop declared it to be false and heretical. (Condemnation of 219 Propositions, trans. E. Fortin and P.O'Neill in *Medieval Political Theory*, ed., R. Lerner and M. Mahdi (Canada, 1963), p. 345, propositions 84, 85, 87, 88 and 90).

²Aristotle, *Meteorologica*, IV:1.

-318-

indestructible; but that this does not preclude its destruction through intention and will, just as it was assumed to be created through intention and will. For something could be willfully destroyed even though its nature is not as such destructible at that time. An artisan, for example, can willingly destroy a chest and make a chair instead. ³

[To this objection the following comments are pertinent]. [Firstly], the hypothesis of a voluntary creation was required to explain certain astronomical phenomena whose generation could not be properly ascribed ^b to natural causes but only to the will. Destruction, however, is to be posited only if nature necessitates it. Moreover, generation is something that is customarily attributed to an intentional agent, but destruction is not, as has been demonstrated. ⁴ Furthermore, when we examine the [nature of] destruction of this sort [i.e., intentional], we find that it would either be intended for the benefit and perfection [of this thing] or for the sheer destruction of it, as happens with ill-tempered men who destroy things because of their anger or from their desire to take vengeance against their enemies ^c or to reap joy in destructiveness because of their evil disposition. If the object is destroyed because of the desire to improve it, this implies either of two things; either the agent destroys the object because he wants to make a more perfect form or he wants to make something else for which he has a greater need. For example, a craftsman might melt a goblet if its form is unsuitable and make a more perfect form or a different vessel that is more valuable. Or he might make an object that is less valuable if he needs this particular object at that moment.

Now since all of this is evident in intentional destruction where destruction takes place for either of the two reasons we have mentioned, it can easily be demonstrated that, since God is not subject to any of the conditions previously mentioned, the world cannot be intentionally

destroyed. For it is not proper to attribute to God a reprehensible act that is performed by those inferior men who intentionally destroy for the sake of destroying. Rather, we find that God performs good and perfect actions in the best way possible. Neither is it possible for God to be angry, since no causes of^d anger can be attributed to Him; nor is it possible for God to destroy an enemy out of vengeance, as is obvious to the reader of this book. Moreover, it is impossible that God will destroy^e this world in order to make a better one. For if this were possible, I would like to know what prevented Him from making this better world at the outset.

³The possibility of non-natural, or supra-natural, destruction of the universe was common in medieval Christian thought (cf. Thomas Aquinas, *Summa Theologiae*, I, a. 104, I, 3-4).

⁴Gersonides' reference is not clear. Perhaps he is referring to chapter 6 of this book.

-319-

That there existed an obstacle which prevented Him or that a new idea occurred to Him is completely absurd with respect to God. For it is impossible that a new idea occur to Him; if this were possible, God would change essentially, which is false. And to posit the existence of an obstacle is also impossible; for God is absolutely omnipotent and can give whatever good and perfection is possible to existent things. This is evident to anyone who observes natural phenomena and [especially] the manner of omnipotence that is found in their creation [such that] they are endowed with whatever good and perfection is possible for them.

In general, if there were an obstacle present, it would either stem from the matter or from something external. It cannot be the former, since God has power over matter and [can] move it for whatever purpose He wants such that He can accomplish through it whatever can be created. And it is impossible to claim that this obstacle is something external. If this were so, it would be possible only if this obstacle had complete dominion over God and could force Him to make a less perfect universe. [But this is absurd.] For God is not a body such that something else could prevent Him from doing what He wants. This is possible in a man: his hands, for example, could be tied up such that he is prevented from doing his activities. Now if there were some [external] entity having power and rule over God, it could not be corporeal; for an imperfect [i.e., corporeal] being cannot rule over a perfect [i.e., incorporeal] being. Nor is there any way whereby a corporeal thing can obstruct the action of a separate [i.e., incorporeal] agent. Thus, if there were some kind of obstacle, it would have to be a separate intellect. But the activity of this intellect cannot be conceived in terms of violence and force, only in terms of desire. That is, [on this hypothesis] God would desire the plan inherent in the soul of this intellect and this desire would prevent Him from generating what can be generated according to the [original] plan in His mind. But this hypothesis is utterly absurd; i.e., that God's desire would not be for that which is most perfect, especially in the light of what we do in fact observe of the perfection of His deeds. Moreover, on this supposition God would be a composite of these two plans, since each one of them is necessarily an object of His thought. And God would be many in actuality; for there is nothing that could unify these two plans, since they are not unifiable such that one would be the perfection of the other. This is quite obvious. Finally, if there were such an obstacle, this universe would remain imperfect forever; for there is no thing that could destroy this obstacle, since it would have no inherent causes of destruction.

It is also demonstrable that it is impossible to assume that God could destroy this world in order to make another one more suited to His needs; for God does not act for His own benefit but for the benefit of the recipient of his activity. Thus, if God were to destroy this world, He

-320-

would do this in order to make a better one. But this has been shown to be false. Moreover, if God were to destroy this world in order to make another from it, this new world would necessarily be like it in every respect. But this is absurd. That this new world would be like this present universe is demonstrable. For there are no other natural motions than those found in this universe, and from these motions the existence of the elements and their compounds is derived. In general, if there were motion in this new world, it would necessarily be rectilinear or circular. If it were rectilinear, there would have to be an *up* and *down*, and from this it follows that there would be a body moving with circular motion, since it is [this body] that generates *up* and *down*. Now if these conditions obtain, the elements and their compounds would also exist. But by the same token it is evident that if the motion in this new universe were circular, the elements and their compounds would also exist.⁵ Accordingly, it is evident that the present universe cannot be destroyed, either as the result of natural causes or as the result of intention and will.

From this very proof it can also be shown that it is impossible for there to have been a world prior to this world, for that alleged universe could not have been destroyed. And so clearly the world was created only once and cannot be destroyed. It is also clear that the thesis that there has been an infinite series of universes [created and destroyed] successively is false, and this has been proved false on other grounds as well. For if this thesis were true, time and motion would be infinite in quantity, and this [consequence] shows that this thesis is false. Moreover, from this thesis it would follow that from contiguous motions continuous and eternal time would result; but this is impossible, as Aristotle has demonstrated.⁶

⁵Hence, this new universe would be exactly like the present universe, no matter which kinds of motion prevail in it. But if there is no discernable difference between these worlds, they are numerically identical, i.e., one.

⁶Aristotle, *Physics*, VIII: 8-9. Gersonides, *The Wars of the Lord*, Bk. 6, pt. 1, chap. 7. S. Feldman, "Platonic Themes in Gersonides' Cosmology", *Salo Baron Jubilee Volume*, (Jerusalem, 1975), vol. 1, 383-405; idem., "The End of the Universe in Medieval Jewish Philosophy", *Association for Jewish Studies Review*, 11 (1986), 53-76.

CHAPTER XVII

SINCE it has been demonstrated that it is necessary that the universe be created and indestructible and that it is not possible for it to have been created from a pre-existing world, it is proper that we now investigate how this creation was possible. Now there are only two possibilities on this question: either creation from something or creation *ex nihilo*. If the former, it would seem necessary that this [primordial] matter have some kind of form, since we do not find matter without some form. But if there is a form then there is necessarily some kind of movement; but this movement cannot be like the movement in the world, since if this were the case another world would exist before this world, which has already been assumed to be false. Consequently, we are left with no other option than to say that [this matter] would have to exhibit irregular motions. Thus, Plato had to posit that the world was generated in so far as it evolved out of disorder into order.¹

Such a theory is, however, beset with serious and insuperable difficulties.² Firstly, such [a primordial matter] would have to exhibit either rectilinear or circular motion; whichever motion would be found, however, would entail the existence of the other type of motion, as has been proved, such that a prior *cosmos* consisting of the elements and the heavenly bodies would result. Thus, it would be necessary that either this^a present world would be preceded by itself, which is

absurd, as has been demonstrated; or that the [primordial] world existed in such a way that the order and rightness, found in *this* world^b could not have been achieved. The latter case is possible only if it were assumed that both the elements and the heavenly bodies exist but that the heavenly bodies are not able to bring about the [proper] order and rightness in these things. This [can be attributed] either to the fact that there are no stars or planets preserving the proper order among the elements; or to the fact that their motions, with respect to velocity or inclination, are not such as to bring about perfection in the sub-lunar world; or to both these factors together: there are no stars or planets and the requisite motions for the perfection of sub-lunar things do not obtain. For if the heavenly bodies were adequate to effect the proper ordering of the elements, and if the

¹Plato *Timaeus*, 48E-53B. For a good discussion of this topic see Gregory Vlastos, "The Disorderly Motion in the TIMAEUS," *Classical Quarterly* 33 (1939), 71-83.

²Aristotle, *On the Heavens*, III:2.

-322-

elements are present, then the sub-lunar things generated from the mixture and blending of these elements would necessarily result. But this is *contra hypothesem*. Therefore, it would seem on this hypothesis that the heavenly bodies are not able to bring about order and rightness in the sub-lunar domain. But if this is the case, the elements themselves would be destroyed and there would be nothing to generate them anew in this long period of infinite time. For, if the heavenly bodies are inadequate to preserve the equilibrium, order and rightness amongst the elements, one contrary element would over-power the other elements and destroy them, as is the nature of any contrary, i.e., it destroys its contrary when it over-powers it. [Accordingly,] the elements would not exist at all in any given portion of infinite time; rather only one of them would exist, i.e., the dominant one. And if this dominant one is the light element [i.e., fire] -- as it would seem by virtue of the incessant motion that generates it -the light element would be in the lower part [of the sub-lunar domain] for infinite time. But this is false. ³It is also false [to suggest] that the elements exist for no purpose for infinite time; for purposeless phenomena occur infrequently and endure only briefly. That the elements would have no purpose on this view is evident; for they exist for that which is compounded from them. Moreover, it also follows from this view that there would be no motion in the world of the elements, since there would be only one element and there can be motion there only if both light and heavy elements exist, as we have already indicated in Book 5 of this treatise. ⁴And this is contrary to Plato's claim that the things from which the universe is created are in motion. Furthermore, on this hypothesis the movements of the heavenly domain would be gratuitous, since the only thing generated in the world of the elements from their motions would be the destruction of some of the elements because of the dominance^c of one of them. But this is one of the grossest errors: that a body can move for infinite time purposelessly and laboriously.

Moreover, this circular motion [of the heavens] requires conceptualization as its principle; for in this kind of motion there is no *terminus a*

³According to Aristotle's cosmology, the heavenly bodies, especially the sun, preserve the transmutation of the elements (Aristotle, *On Generation and Corruption II*:10). Now if *ex hypothesi* there is some imperfection in the heavenly bodies, this preservation, or equilibrium, will be upset, resulting in, for example, the existence of only one element, fire. Fire is considered to be the dominant element presumably because it is the fastest and closest to the celestial domain, which is eternal, and is thus continuously being generated and moved by the

heavenly bodies (Aristotle, *Meteorologica*, 1:3). In a state of disorder, however, fire would not only be at the upper, or outer, boundary of the terrestrial domain, but lower down in this domain, as well (Ibid., 310a [10](#) - [14](#)).

⁴Gersonides, *The Wars of the Lord*, Bk. 5, pt. 3, chap. 2.

-323-

quo nor *terminus ad quem*. ⁵Now this conceptualization is nothing but the fact that from this motion there emanates something to the sub-lunar world; for from this motion no benefit can accrue to the heavenly body. And it has been demonstrated earlier that the mover [of this motion] must be separate [i.e., incorporeal], ⁶since this motion is always derived from one and the same conceptualization. It would be absurd to claim that there is a separate mover that moves for a purpose but has no instruments whereby this purpose can be realized. And if we assume that the spheres have some instruments and movements necessary for the perfection of the sub-lunar world but not all of them -- and hence the order and rightness resulting therefrom would be imperfect, [which] would necessarily happen, if [only] *some* heavenly bodies were present -- it would then follow (in the same way as our proofs for the creation of our present universe) that this primordial world has been created and that the origin of its creation is to be attributed to the will of the creator. ⁷But if this is so, then God has created one world after another, which has been shown to be absurd. It would also follow that time and motion are quantitatively infinite, which thesis has also been shown to be false.

Now if someone were to maintain that for Plato this disorderly motion is not the result of some form which moves the matter, but that Plato posits ^d that this matter moves itself in an irregular manner, we reply that this is also absurd. For, as Aristotle has shown in the *Physics*, it is impossible for matter to move itself; rather, it is necessary that it have a mover. ⁸

Since it has been shown that the theory of creation from something in the [Platonic] version is false, it might be thought that the only remaining alternative is creation *ex nihilo*. Now it would seem that this latter theory is possible in so far as we observe that whatever is generated is [generated] from nothing, as we have mentioned earlier. ⁹But a closer

⁵In circular motion there are no real *termini a quo* and *ad quem*, since, as Maimonides says, "The heavenly sphere does not move for the purpose of withdrawing from what is bad or approaching what is good.... the circular motion of the sphere is consequently due to the action of some idea..." (Maimonides, *Guide*, II: 4).

⁶The celestial spheres have different intelligences as their movers. But intelligences are not individuated according to matter; hence each intelligence qua mover is a separate intelligence (Maimonides, *Guide*, II:4).

⁷The imperfect and irregular motion in the Platonic "stuff", or receptacle, results in part from the fact that it was assumed that the heavenly spheres do not have *all* their instruments, i.e., the planets and stars, but only *some* of them. But such a world would exhibit the features that indicate creation according to design and will, especially since such features could not be explained according to the inherent nature of the nature of the elements contained therein, as it was shown in chapters 7-9 of this Book.

⁸Aristotle, *Physics*, VII: 1; VIII:4.

⁹Gersonides, *The Wars of the Lord*, Bk. 6, pt. 1, chap. 3.

-324-

examination of this supposition shows that it does not prove that a body can be created ^e from no body at all; only forms, not bodies, are created in this manner. In general, a form gives something *similar* to itself; thus, it gives the form ^f; for all forms are objects of the intellect [i.e., incorporeal]. But would that I knew how a form can give corporeality! ¹⁰

In general, generation, whether natural or intentional and voluntary, involves [only] the generation of a [new] form; corporeality is not generated at all. Thus, nature and art generate something from something. This is also the case in accidental generation. Consequently, it is assumed as a self-evident axiom in physics that nothing is generated from nothing. Actually, form too is not generated essentially; rather, a compound substance is generated from the matter and the form of something that has some possibility to receive this form. Thus, even on earlier supposition it doesn't follow that a body itself can be generated from something non-corporeal.

Moreover, if we were to admit the theory of creation *ex nihilo*, we would have to posit a vacuum. But the vacuum has been scientifically demonstrated to be impossible. That *ex nihilo* creation implies a vacuum is evident. Prior to the creation of the world it was either possible, necessary or impossible for a body to exist in the dimensions in which the world does in fact exist. If a body necessarily existed [in these dimensions], then it did not cease existing and the world existed before its creation -- which is absurd. If it was impossible [for a body to exist in these dimensions], then it would be impossible for a world to be actualized at all. And if it were possible, then this place would constitute a vacuum, since a vacuum is defined as a place devoid of body but capable of having a body in it. Thus, the doctrine of *ex nihilo* creation implies a pre-existent vacuum. ¹¹ Moreover, since in that place [i.e., that region of the pre-existent vacuum where the universe is to be "located"] there would be no nature that makes that place more [likely] to be the locus of a body than any other [region] in the vacuum, which is outside the universe, it would have been possible for any region in [this vacuum] to be the locus for the generation of a body [i.e., the universe]; for there is no difference among the parts of that vacuum that would necessitate one place [to be the locus of the world] rather than another, since the vacuum is absolute privation

¹⁰Since God is pure form, if He were to create *ex nihilo*, He would create forms, not matter. The general principle operative in this context is that causes make effects that are ontologically similar: incorporeal agents make other incorporeal substances; corporeal agents have corporeal effects.

¹¹Aristotle, *On the Heavens*, III:2.

throughout. Accordingly, an infinite vacuum would exist even *after* the creation of the universe. But this is clearly absurd. ¹²

Indeed, it could also be asked, for what reason did God create the universe in this particular place in the vacuum and not in another? For it would seem that the activity of a Separate Form is not restricted to a particular place; this is necessary since it is not in a place; rather, its activity extends to whatever place is prepared to receive its will [i.e., intention]. ¹³ Thus, it is the case that the Agent Intellect exerts its will upon sub-lunar things *wherever* they exist. ¹⁴ Consequently, since all of the vacuum would indifferently receive the will of the agent, all of the vacuum would be necessarily filled by body emanating from this agent, and hence there would be an actual infinite body. But this too is absurd. ¹⁵ In general, something is not generated in a definite place unless the original material or its agent or both factors are in that place. For example, rain occurs in a definite locality because a cloud is in that region; or a house is built in a specific place

because Reuben the builder and the materials are at that place, and the form [of the building] that is generated is at this place because that which receives the form is at that specific place. Now there is a difference between what is produced by an agent that has a particular locus and what is produced by an agent that does not have a particular locus. In the former case, the action is necessarily localized in one place at one time; in the latter case, the action can be in many places at one time so long as something is present ^g that is disposed to receive the will [of the agent]. Accordingly, if it is assumed that creation was *ex nihilo*, it is evident that there would be nothing that would determine [the universe to be localized] at a specific place, neither from the aspect of the agent nor from the aspect of that in which the world would be generated. Consequently, either the world would be [extended] uniformly

¹²Since a vacuum is defined as empty space that can be occupied by a body, the hypothesis of creation *ex nihilo* not only implies a pre-existent vacuum but also an external vacuum surrounding the universe; for no one part of the vacuum is more "occupiable" than any other part. Hence, if one part of this vacuum has been filled by the creation of a finite universe -- and a universe must be finite according to Aristotle -- the vacuum, which is infinite, is still only partly filled up [cf. E. Grant, "Medieval and Seventeenth Century Conceptions of an Infinite Void Space beyond the Cosmos," *Isis LX* (1969), 39-60. A. Koyré, "*Le vide et l'espace infini au XIVe siècle*," *Archives d'histoire doctrinale et littéraire du moyen-âge*, XXIV (1949), 45-91. Leibniz, *Leibniz-Clark Correspondence*, II: 5, III: 6-11, IV:33, Touati, *La Pensée*, 244].

¹³The term *ritzui* derives from *ratzah*, "to will." Klatzkin's German equivalent "planvolle Einwirkung", "planned influence", nicely captures the Hebrew (Touati renders it as "*volonté*". *La Pensée*, p. 245). But in English this is a bit awkward. Hence, I shall render it simply as "will."

¹⁴Maimonides, *Guide of the Perplexed*, II:18.

¹⁵Aristotle, *Physics*, [203](#) b [29](#).

throughout the entire infinite vacuum; or, in the place of the world [to be created] there would be something ^h in this place that determines that this generation be in [this] specific place. But if this were the case, then a body must be there, since whatever is in a place must be a body. ¹⁶

Moreover, before the world was created its existence would have been either necessary, impossible, or possible. If necessary, then the world did not cease to be; if impossible, then it could not exist at all; hence its existence would have to be possible. But a possibility needs a substratum [to inhere in]. Now if this is so, it would be necessary that there be a substratum in which there is the possibility of receiving the ⁱ voluntary generation, the necessity of which has been explained. Consequently, this generation must be from something, which is *contra hypothesem*. ¹⁷

Finally, before the creation of the world the First Agent would have been a potential [agent] of this generation. Since correlatives exist together, it would be necessary that as the cause is a potential cause, so the recipient is also potentially receptive. But that which is potentially receptive is a body; and so a body would be necessary prior to the creation of the world. In short, we see that the thesis of creation *ex nihilo* is absurd. For it is impossible for body as such to be created; all the more so is it impossible for it to be created absolutely from nothing. Indeed, body can be said to be created only in the sense that it has certain forms which are generated in it.

It is also evident that it is impossible to avoid these difficulties by means of our earlier distinction between total generation and the generation of particular substances. For the above-mentioned consequences follow from the very concept of generation, whether it be natural or voluntary, and not from the nature of particular generations as such. This is quite clearly indicated in these difficulties. ¹⁸

¹⁶Suppose we have a moderately sized empty vessel and enough metal filings or nails to fill that vessel. When we pour in the filings they will first cover the bottom of the vessel and then fill up the vessel completely and uniformly. But if there is a magnet in the vessel, the filings or nails will cluster around the magnet, and then the distribution of matter in the vessel will not be uniform nor will the vessel be completely filled, since there will be places in it where there are no filings. Let us now apply this example to the hypothesis of creation *ex nihilo*.

Gersonides argues that the "filling" of the empty space, or vacuum, is such that either *all* of this vacuum is filled uniformly, and hence the world would be infinitely large, which is false; or, if the filling is "localized", there would have to be something already in the vacuum that localizes or attracts the matter that constitutes the world. But in the latter case this "localizer" would have to be a body, which is *contra liypothesem*. Thus, the hypothesis of creation *ex nihilo* is false (Grant, op. cit. p.50, n.50. Touati, *La Pensée*, 245).

¹⁷Maimonides cites this as an argument against creation in general (Maimonides, *Guide*, II: 14, fourth method).

¹⁸Touati, *La Pensée*, 208-20.

-327-

If someone were to object that these difficulties can be avoided by means of Maimonides' principle, i.e., the nature that existed at the time of its generation is different from nature after its generation and perfection, and hence reality [as it now is] is no evidence for what it was before its generation, ¹⁹we reply as follows. What is validly entailed by [Maimonides']principle is this: whatever exists in a [particular mode] of existence because of a [particular] attribute that it (now) possesses does not have to have been in this mode of existence before its having this attribute. However, whatever is necessary of something [simply] because it exists, [no matter] which attributes it may have, must be present in it at the moment of its generation. It is evident that many of the [above-mentioned) difficulties ensue from not [giving proper] attention to the [particular] attribute which this existence exhibits. ²⁰Accordingly, even with this principle [of Maimonides] the doubt^j inherent in [these difficulties] still remains.

We have already indicated to you that Maimonides accepted the *ex nihilo* theory only to avoid the difficulties of Plato's doctrine, which had

¹⁹Maimonides, op. cit., II: 17.

²⁰Here Gersonides takes issue with Maimonides' argument against Aristotle, although he agrees with one of its conclusions. Maimonides attempted to refute Aristotle's scientific arguments against creation by undermining their logic: they all presuppose that one could universally retrodict the applicability of the laws of nature that are true of the present state of something to any of its past states, especially to the moment of its generation. Maimonides argued that this inference is invalid: whatever may be true of an object in its perfected, or complete, condition need not have been true of it in any of its less perfect states. Aristotle's arguments against creation are invalid because they all presuppose this rule of inference. Gersonides contends that Maimonides' critique of Aristotle fails because it is not sufficiently precise. In particular, it fails to distinguish between those conditions of a thing that are necessarily true of

it in so far as it is an existent thing of a certain sort and those conditions that are necessarily true of it at a certain stage of its development or maturation. The former, Gersonides claims, *are* universally retrodictable, the latter are not.

Let us consider Maimonides' own example to illustrate this point. It is illicit, he had argued, to infer from what a human organism is like or does at the age of four to what it was like while a fetus. A child of four cries and talks, while obviously a fetus doesn't. Now what renders this example irrelevant to the issue at hand, Gersonides would contend, is that the properties in question are not properties of an existent organism as such. Suppose, however, we were to consider the requisite features of a living organism *qua* living: it would need certain chemicals, e.g., oxygen, carbon, etc.; it would require continuous nourishment, etc. These conditions are true not only of the four year old, but of the fetus as well, even though the means by which the latter receives these nutriments differ from those employed by the four-year old. On the other hand, even though the young child *typically* cries and talks, these features are not at all true of the fetus. In the latter case, Maimonides' principle holds; but not in the former, since there we are concerned with what it is to be a living organism. Whatever is true of living things as such is true of them *no matter their stage of development or perfection*.

-328-

been raised by Aristotle, not that it was necessary for him to accept this theory because of Scripture. For Maimonides said that if there were a proof for Plato's theory which would be proper to believe, it would not contradict any Scriptural principles but would agree with them. ²¹ If the Torah really taught creation *ex nihilo*, this statement would be false. It is therefore evident that the view of the Torah is that the world is created; but it doesn't follow from this that it is created absolutely from nothing. Indeed, it would seem that the Torah throughout describes creation as something from something, except in the case of the Intelligences, concerning whose creation God said "Let there be light", [implying *ex nihilo* creation in this domain only]. But the firmament was created from the primeval waters, as it said "Let there be a firmament in the middle of the waters" [Genesis 1:6]. And all the other things mentioned in Genesis are also created from something; for example, "Let the earth bring forth produce", "Let the waters swarm with life", "Let the earth bring forth", "And God fashioned man from the dust of the earth." This point will be demonstrated in detail in the next part of this Book.

Maimonides thought, however, that only the *ex nihilo* theory could avoid the difficulties which Aristotle brought against [Plato's] theory of creation, and therefore he believed that creation *ex nihilo* is the foundation of our Torah. Accordingly, he introduced the above-mentioned principle in order to "build a wall around the Torah protecting it from all those who throw missiles against it." ²² It is evident, however, that if we ^k think we can avoid the above-mentioned difficulties by means of this principle, we shall ^l derive invalid conclusions from it. Moreover, this principle, when construed in a comprehensive way, has not permitted us to inquire into the generation of that which exists, [though] it does not hide ^m from us an investigation into [what occurs] after its generation. But if this is the case, there would be no advantage in assuming the creation of the universe in order to affirm the belief in miracles, for whose sake it was necessary to believe ⁿ in creation, as Maimonides says; for the miracles have occurred after the universe exists ^o. But if, after the creation of the universe, only that which the nature of existence necessitates is possible, as would seem from this principle, there would be no way to believe in miracles!

We have [admittedly] digressed; but we were compelled to do so in order that our readers should not suspect us of departing from the Torah [merely] because we have rejected this view [of creation *ex nihilo*], and have mentioned the various philosophical difficulties of this theory. In

²¹Maimonides, *Guide*, II: 25.

²²Ibid., II: 17.

-329-

general, we must accept whatever view is philosophically provable, as Maimonides himself says, even the doctrine of Aristotle if it were proved; and we must interpret whatever in the Torah seems to contradict this view in a way that agrees with the truth. ²³

Let us now return to our [main] theme. Since it has been demonstrated by many proofs that this creation is either from something or from nothing and that it can.5-6ot be one of these alternatives [exclusively], we must say that it is in one sense created from nothing and in another sense created from something. This [third] alternative eluded our predecessors. The world is created from something in so far as it is generated from [some kind of] body; it is created from nothing in so far as this body is devoid of form. It is clear that in this way all the aforementioned difficulties can be avoided. For the difficulties accruing to the Platonic theory result from the hypothesis that this body has some kind of motion, as we have mentioned. But if we say that in so far as it has no form it lacks motion, these problems vanish; for something of this sort does not possess motion, since matter doesn't move itself. Now the difficulty that pertains to those who assert the creation of the world out of nothing in an absolute sense derives from their rejection of a substratum [for generation]. But when we posit a substratum for this generation, all those ^p difficulties vanish.

I shall now describe how one can conceive of the manner in which this creation took place. Of this [primordial] body from which the world was created, God made one part [in such a way] that it preserves its shape ²⁴, i.e., the heavenly domain, and he created in it the stars and planets and [their] spheres, which move these bodies in such a way that from them emanates whatever is required for the perfection of sub-lunar phenomena. Some of this [primordial] body, [however], remains without preserving its shape: this is what is between the spheres of one heavenly body and the spheres of another heavenly body. Moreover, God gave a nature to some of this [primordial] body capable of receiving all forms, i.e., the sub-lunar matter, [which nature consists in] the forms of the elements created in this matter and the capacity given to these elements to be transformed into and inter-mingled with each other. In this way the sub-lunar matter is disposed to receive all the forms.

That this [primordial] body had no definite shape before the creation of the world can be shown in several ways. Firstly, preserving a definite

²³Ibid., II:25.

²⁴Gersonides gave a more detailed discussion of this "first body" in Bk. 5, pt. 3, chap. 2.

According to Touati, the chief characteristic of this "first body" is indeterminate, or pure, tri-dimensionality (Touati, *La Pensée*, 253). In *his Matter, Space, and Motion*, (Ithaca, 1988), Richard Sorabji discusses the history of this concept of pure tri-dimensionality in part I.

-330-

shape has the status of form and perfection vis-a-vis the condition of not preserving a definite shape. Thus, you find that animate creatures preserve their shape; and those among them that are most alive most truly preserve their shape, as for example the heavenly bodies and spheres. Secondly, we find that that which has no form amongst bodies does not preserve its shape, and

this is the body that doesn't preserve its shape, which has been proved to exist between the heavenly bodies. ²⁵That it was possible for God to endow one and the same matter with different forms or dispositions stems from the fact that the generation of the universe was voluntary. In this way it is possible for the heavenly bodies to have different natures with respect to what emanates from them via their illumination, although their matter is one and the same, as we have indicated earlier. ²⁶This shows that the source of all the [kinds of] matter is numerically one; for the body that is devoid of all nature [i.e., form] cannot be differentiated in its parts. And this is proper. For, just as the source of all forms is numerically one form, so is it proper for the source of all matter to be one matter. For this reason some of the ancient philosophers concluded that there are two deities, because of their belief in two material principles: [one for the] sub-lunar matter and [one for] the heavenly domain. Finally, our thesis that the primordial body, from which this world has been created, does not preserve its shape should not be construed as implying that it had some kind of motion by virtue of which the positions of some of its parts were mixed up and were [then] transformed back into the [original] positions by a different process. For this view is self-contradictory. Our view implies that this body lacks the nature by virtue of which a body can preserve its shape.

²⁵Gersonides, *The Wars of the Lord*, Bk. 5, pt. 1, chap. 2, and pt. 2, chap. 2.

²⁶Supra, Bk. 6, chap. 8.

CHAPTER XVIII

WE ought now to examine various difficulties that [appear to] follow from this [doctrine of] creation that has [just] been proved. For by means of such an investigation we shall attain complete knowledge of this subject, i.e., when no doubt or opposition will remain.

First difficulty. Necessarily either something does not remain from this [primordial] body after the creation of the world or something does remain. If something were to remain, it would exist for no purpose, which seems to be absurd. If we were to say that nothing remains, then this body would necessarily be either spherical as such or non-spherical [in itself] but God moves its parts and makes it spherical. If we say that it is spherical as such, I am at a loss to explain how this body just happens to be spherical. After all, it does not have [*ex hypothesi*] any nature at all, as is evident from its very being. Thus, it is evident that it does not have a nature that necessitates a spherical shape. But it is equally absurd to say that it has this shape, which is the most perfect of all figures, by accident. And it is also absurd to say that the size of the [primordial] body was by chance the same size as the proper size of the world. For it would appear that it is impossible for the world to have a greater or smaller magnitude than it has, since all natural and animate substances have determinate sizes, as has been previously mentioned. ¹And if there were some latitude in [the range of] this size, this would be because of its individual nature, not because of the nature of its species. ²Thus, if it were the case that the elements were either greater or smaller than they [actually] are, then it would not be possible for things in the sub-lunar world to have whatever is necessary for their perfection and preservation. For, if the elements were greater than they are, these existent things would receive more of an effect than is proper from the excess of any one of the elements in the periods in which they dominate these things. And if the elements were smaller than they are, these sub-lunar things would

¹Gersonides, *The Wars of the Lord*, Bk. 6, pt. 1, chap. 11. The problem of "surplus matter" was discussed by Plato and Aristotle, both of whom rejected the possibility of any matter not

within this world (Plato, *Timaeus*, 32D-33B. Aristotle, *On the Heavens*, I:7, 275b 7-12, II:4, 287a 12-16). Philo too raises this question, and like Plato, denies the possibility of any surplus matter (Philo, *De aeternitate mundi*, XXI; *De providentia*, fragment 1; *De plantatione*, II, 2; *Touati*, *La Pensée*, 262).

²Supra, chap. 8. The difference in size is an individual difference, not a difference in species.

-332-

not receive the proper effect from them when they are dominant. In this way it can be demonstrated that the actual size of the celestial spheres and bodies is what it should be; for they do not possess individual natures such that there could be a quantitative latitude in their individual [sizes]. Therefore, it is evident that if there were any other world it would have the same size as this world and be similar to it in all other respects. The spheres of the sun, for example, if there were more than one sun, would have no individual natures by virtue of which they could be differentiated, and the same is true for the other celestial bodies. Moreover, since it is impossible for one world to be differentiated from a second world (if there were such a world) by means of the individual nature, since the world has no contrary, it is evident that the universe must have the size and features that it does have. ³Furthermore, since the plan, order, and rightness of the universe emanate from God in so far as He is the plan, order, and rightness of existent things, and since the order that is in His soul is one and immutable, it follows that the plan in the world that emanates from Him is [also] numerically one and that there do not emanate from Him diverse plans. Thus, it is evident that we cannot say that the body from which the universe is generated is spherical as such and that [after creation] there is no surplus matter; for this would be unlikely to be the case merely by chance. But if we were to say that this body is not spherical [as such] and that there is no surplus matter after creation of the universe, it would follow that there is a vacuum, if we allege that God gathered together this matter and made it into a sphere. This is obvious. In addition, the second difficulty previously mentioned also ensues: I cannot imagine how it is that this [primordial] body would happen to be the same size as that needed for [the making of] this world. And so, no matter which alternative we hold [with respect to the question of surplus matter] there are serious problems. ⁴

³In Bk. 6, chap. 8 it was pointed out that the range within which the sizes of individuals within a species can vary is limited and that this variation stems from the individual natures, or mixtures, of contrary elements in each individual (see especially footnote 2 in chapter 8). Since the heavenly bodies have no contraries in their nature, they do not have individual natures as such to which their differences in size can be attributed. Accordingly, if there were several universes they should be alike in all significant respects, and hence indistinguishable. But if there is no way to distinguish them, there is only *one* universe, whose present size and other features cannot be either replicated or varied (Aristotle, *On the Heavens*, I:9).

⁴H. Wolfson, "Plato's Pre-existent Matter in Patristic Philosophy," *The Classical Tradition*, ed. L. Wallach (Cornell University Press: Ithaca, 1966), 419, reprinted in his *Studies in the History of Philosophy and Religion*, ed. I. Twersky and G. Williams, vol. 1 (Harvard University Press: Cambridge, 1973) chapter 9.

-333-

The second difficulty. It would follow from the preceding argument that if this [primordial] body did not possess the proper size such that the world could be created from it, there would be no world at all and God would be eternally in a condition of not emanating anything to anything, which is utterly unacceptable. Indeed, it would seem from such a hypothesis that the generation of the world would ^a not be possible unless this [primordial] body happened to be the right size

for the [generation] of the world to be achieved. But this means that the origin of the generation of the universe comes about ^b by accident and chance. And this seems to be absurd.

Third difficulty. It might be thought that if there were another eternal thing besides God, it would be a deity like Him. But this is an absolutely shameful [idea]. ⁵

Fourth difficulty. It would seem necessary to believe that prior to creation this body would be either in motion or at rest. If it were in motion, then all the difficulties previously adduced against Plato are pertinent. If it were at rest, then it would be at rest either naturally or under compulsion. In either case, however, a form and nature, would be required, which is *contra hypothesem*. ⁶ Moreover, such a hypothesis is really tantamount to the belief that the universe existed before its generation. For if it were at rest, whether by nature or by compulsion, the elements would necessarily be present, since there is no rest, natural or compulsory, without an upward and downward direction. And in the case of compulsory rest, there must exist one element which is either lower than that which is heavier than it or higher than that which is lighter than it. Thus, we have light and heavy; and it follows from the existence of upward and downward directions that the heavenly bodies exist, as has been proven in the natural sciences. Moreover, many of the absurdities that Plato's theory entailed are also entailed by this view, as anyone who has studied this treatise can see.

Fifth difficulty. Matter is never found without form, according to what has been proved of the nature of the sub-lunar world. All the more so is this the case when this matter has existed [*ex hypothesi*] for infinite time.

Sixth difficulty. When a thing exists in a defective state, it exists in that unnatural condition for a short period only, whereas the existence of a thing in its perfect state is much longer. For example ^c, the duration of health in living animals is greater than the time of sickness. Now if we were to posit the existence of such a body in the manner suggested earlier,

⁵Saadia Gaon, *Book of Beliefs and Opinions*, Bk. I, chap. 2.

⁶In Aristotle's physics a body capable of motion or rest is a body having a definite nature or form. (Aristotle, *On the Heavens*, III:2; *Physics*, II:1.

the time of its imperfect existence would be infinitely longer than the time of its perfect existence, [which seems absurd].

Seventh difficulty. We find that in every generation, whether voluntary or natural, the generation does not take place from anything whatsoever. For example, one does not make a ring out of water, salt, or dust but out of something capable of becoming [literally "receiving"] what the artisan wants [to make]; e.g., in this case metals and other similar materials from which a ring can be made. This is even more evident in natural generation. For example, a man is not generated from the semen of a horse. Now, if this is so, how is it possible for all the various species in the world to have been created from one and the same matter? Would that I knew! Moreover, it could be asked, what forced ^d this matter to receive the will [i.e., influence] of the producing form? This is indeed an obscure and difficult question. ⁷

Eighth difficulty. It would seem necessary that the elements and the surrounding, [or uppermost], sphere should exist prior to the generation of the universe. For it would appear that the natural places *up* and *down* were [already] in existence: i.e., the [abstract] dimensions in which these

natural places would exist after the generation of the universe. But if there were these places, there would also be the heavenly bodies; and from this it follows that the elements would exist by nature in the places of *up* and *down*.⁸

Ninth difficulty. It might be asked, why did the agent will to create [the world] at this moment and not before? Was it the case that a new thought occurred to Him that He did not have previously? Or, was it that He needed the world now but not before? Or, was there some obstacle preventing Him from [creating the world] which now was removed? All of these reasons are absurd, as has been explained.⁹

After having mentioned these ineluctable difficulties inherent in this doctrine [i.e., creation from some primordial body], it is incumbent upon us to try to resolve them as far as it is possible. But before I proceed to answer the first of these difficulties, I shall lay down a useful methodological rule in this investigation. Anyone who engages in some inquiry

⁷Saadia Gaon, op. cit.

⁸This argument presupposes the principle that abstract space cannot be individuated by itself. Bodies are required to differentiate the parts of space. In the Aristotelian cosmology, for example, the natural places of *up* and *down* are differentiated by the presence of the appropriate elements, fire and earth respectively. The question whether space by itself can be the *principium individuationis* is a topic of modern philosophical interest (cf. M. Loux, ed., *Universals and Particulars*, (Doubleday: New York, 1970.)

⁹Gersonides, *The Wars of the Lord*, Bk. 6, pt. 1, chap. 16. Maimonides, *Guide*, II:14, fifth method. These questions have had a long history. See Sorabji, *Time, Creation, and the Continuum*, chap. 15.

ought to know what can and cannot be proved in that inquiry. For example, a geometer cannot prove a piece^e of medical knowledge in so far as he^f is a geometer. And if he does not know the scope of his science, he will embark upon questions that are beyond his competence as a geometer. Similarly, he ought to know which topic, amongst the various topics pertinent to the subject he is investigating as a geometer, is such to enable him to achieve perfection in that subject, and which topic will not. For example, take the length of the circumference of a circle: if it were an object of proof in some science it should be provable in geometry; yet complete knowledge of it is not attainable [even] in geometry.¹⁰ Hence, it is evident that complete knowledge of this topic is not attainable in any science.¹¹ If a geometer does not know that a particular question is of the sort that cannot be completely solved, he will waste his time or make errors, as was the case amongst the ancient geometers who tried to square the circle. Thus, we must first determine if knowledge of this subject is possible for us; i.e., if it is possible for us fully to know the shape and quantity of this body from which the world was generated.

We confess that it is clearly out of our reach to arrive at [perfect] knowledge on this question. In so far as this body is not created by an agent, there is no way for us to determine its shape and quantity by saying, [for example,] that its shape or quantity is such and such for some particular purpose; for whatever does not derive from an agent cannot be assigned a purpose, unless this [purpose derives] from that aspect in the thing that is itself derived from an agent. Accordingly, it is impossible for us to *prove* whether or not there is any surplus [primordial] matter after creation. At any rate, we do know that there was enough [such matter] for the creation of the universe; otherwise, there would have been no world. Now it is possible that some [matter] was left over. For we do not reject⁸ the possibility that with respect to something which is not

derived from an agent there could be something in it that exists for no purpose. Rather, this is precisely one of the properties of a thing that does not derive from an agent as such. Similarly, it is necessary that this [body] be of such a shape that the sphere of the universe could be completely made within it; otherwise, there would necessarily be a vacuum. Again, it is necessary that this [body] be finite [in magnitude], since this is a necessary feature of bodies qua bodies. Now this seems to be what is known by us about [this] body. Nevertheless, we do not definitely know whether or not there is any surplus matter. Perhaps it so happened

¹⁰No geometrical construction is possible by which a straight line may be shown to be equal in length to the length of the circumference of a circle.

¹¹Since it is the province of geometry to solve problems of this sort, this problem is insoluble because geometry cannot solve it.

that its quantity was such that only this world^h could be made from it and that its shape was spherical, although it is unlikely that this could have been so [merely] by accident. [On the other hand], perhaps there is a surplus.

Now it is possible, on the basis of the few principles [pertaining to this subject] at our disposal, to show that we should believe that there is some surplus. For it is unlikely that this body would be the same size and shape as our universe by chance. Moreover, it is fitting that there be something intermediate between bodies that are completely perfect and alive and that which is absolute privation [i.e., nothingness]. And this is the body devoid of form which is, as it were, intermediary between existence and privation, as we have said earlier. We admit that this argument is quite weak, but we cannot provide a stronger proof, since the nature of this body is such that complete knowledge of it is impossible because it does not derive from an agent. However, whether there is another universe in this matter or many such worlds; or whether or not some matter is left over from which another universe could be made, are topics that will be discussed, as best we can, in the next chapter. It is evident that we have in this manner completed our solution of the first difficulty. For it had been alleged that it would be false to claim that there is a surplus of this body from which the world was created, since if there were such a surplus it would be gratuitous. But now it is clear that this is not false for that which does not derive from an agent; rather, this is one of the features that characterizes things that are not the effects of an [intentional] agent, as we have previously said.

Reply to second objection. This objection maintains that on our theory [i.e., creation from a primordial body] creation would not have been possible unless it so happened that of this body there was the right amount for the creation of the world; hence, the principle [or cause] of the creation of the world would be attributable to accident and chance. Moreover, [the objection continues,] it would follow from our theory that if this body had not been of the [right] magnitudeⁱ such that a world could be created from it, nothing would ever have emanated from God to anything else; and this is completely absurd. Now, an examination of this objection will show that it is not so serious. A principle of generation involves two aspects: an agent and a recipient. With respect to the former, the [activity] must be intentional, for the agent is active precisely in this sense, [i.e., he *intends* to make something]. Whereas with respect to the recipient, this condition is not relevant, since the recipient has no special skill in receptivity for that which happens to it. Rather, what is necessary for the recipient is that it exists; for if it does not exist, no activity can arrive from the agent, just as it is impossible for someone to do good where no beneficiary of his action is present. Now, just as there

would be no defect with respect to God if He had not created the universe were there nobody to receive the creative act, so there is no defect in Him if He did not create the universe if there was no body of the right size to receive the creative act. Moreover, it is especially clear from what we have already said, that God does not need this world, since He is in His essence perfect and does not acquire perfection from something else; however, He acts by way of goodness and compassion. Therefore, it is not impossible for Him to exist eternally without imparting His goodness if there doesn't exist something to receive it. And thus the second objection is removed. ¹²

Reply to third objection. This objection is weak. It does not follow when we posit this body to be eternal that it is on the same level of being as God, so that it is divine like Him. For God is not divine because He is eternal and all other things are not. For even if it were possible that everything were eternal^j, God alone would be the deity, since He governs everything and gives them^k their law and order which they possess. In short, God is the deity precisely because of His great level [of perfection], from whose great wisdom and power emanate the beneficial order and rightness found in existent things. The eternal body, however, has no such features, but it is utterly and essentially deprived of goodness^l. And it is the case that whatever attains a greater degree of goodness is thereby more noble; so that a man is more noble than an animal and an animal is more noble than a plant. Accordingly, it is clear that this body is utterly defective, whereas God is absolutely perfect. Consequently, this body has no share in divinity at all; for it is farther away from divinity than anything else. And so this rhetorical objection has been removed.

In general, whatever goodness a thing possesses is acquired from God; whatever evil it has is derived from this material principle, by virtue of its essential and natural imperfection. This is evident from our preceding remarks. For this reason our Rabbis have agreed that the principle of good is different from the principle of evil when they said: "No evil descends from above."¹³ Whatever is of this nature [i.e., evil] can not be described as divine. This is obvious and needs no further comment.

Reply to fourth objection, which is also rhetorical. It is necessary that a body which is naturally capable of motion can be either in motion or at rest; consequently, if such a body is not in motion it is necessarily at rest. But a body whose nature is not to be in motion cannot be described as at rest, just as a wall, e.g., cannot be described as blind, since it is unable by

¹²Philo, *De aeternitate mundi*, 25; *De providentia*, Fragment 1. Origen, *On First Principles*, trans. Butterworth (New York, 1966), Bk. II, chap. 1, pp. 79-80. Maimonides, *Guide*, II: 12 and 18.

¹³*Midrash Rabbah Genesis*, 51:3.

nature to see. Thus, this body obviously cannot be described as either at rest or in motion. And so this objection has been answered. From this it can be shown that before the creation of the world there was no time at all, since there was no motion or rest; and whatever does not move or rest does not take on temporal properties, as has been shown in the *Physics*.¹⁴

Reply to fifth objection. In the previous book of our treatise we answered this objection [that there is no matter without some form] in our discussion of the body between the spheres that does not preserve its shape. It is possible to prove the existence of such a body in another way.

Since form exists with matter, as is the case with corporeal forms, and form exists separately by itself, as is the case with the Separate Intelligences, it follows that matter exists without any form. For there is nothing in the nature of these two existences [i.e., form and matter] that requires that they exist together. However, it would be impossible for matter to exist without form in sub-lunar existents, since all these things take on the primary qualities, which are ^m the forms of the elements. And it is impossible for sub-lunar things to be deprived of these qualities entirely; rather they change from contrary quality to contrary quality and acquire whatever form is proper to the level they have with respect to these qualities and mixtures. This is evident to those familiar with the sciences. This is the nature with which God has endowed the sub-lunar matter to receive all the forms, some of them are [received] by means of the others by virtue of the elemental forms, with which He endowed them at first, and by virtue of the possibility given them to change from one contrary to another with respect to these [primary] qualities. For it is false that this possibility to receive all forms could be from the matter itself, since it is by nature devoid of all form; for possibility is by nature a function of form. A [specific] thing ⁿ is not generated from anything whatsoever; rather it is generated from a thing of a specific type, just as verdigris, [or copper dioxide] is generated from copper, and a man ^o is generated from the semen of men. Indeed, the specificity of a thing derives from the form, since matter is common to all [sub-lunar] things. Finally, the objection that this [primordial] body would have to be devoid of form for infinite time is obviously false, since, as we have just pointed out, prior to creation there was not any time at all, all the more so was there no infinite time.

Reply to sixth objection. This objection is also easily answered. A thing possesses ^p a perfect attribute more than an imperfect attribute because of its nature, which, by virtue of the natural course of things, requires that it have the more perfect attribute. As is the case, for example,

¹⁴Aristotle, *Physics, IV*: 10-11. See Sorabji, *Time, Creation, and the Continuum*, chapter 15 for earlier versions of this argument.

in health, where an organism is naturally well, unless accidental and unnatural factors [render it ill], which occurs infrequently. But this is not necessarily the case with this [primordial] body which has no nature that entails its perfection. This can be shown [even] in sub-lunar things when a substratum is deprived of the nature that entails its perfection: the time of its being in a defective state may be longer ^q than the period of its being in its more perfect state. For example, the matter from which Reuben has been composed existed for a longer time without human life than the time it has been attached to human life. Moreover, it has already been demonstrated that this body did not exist in time before creation of the universe. Hence, it is clear that there was no infinite time [before creation]; for the thesis of infinite time has already been shown to be false.

Reply to seventh objection. This difficulty is very profound; yet it can be disposed of easily by some of the preceding remarks. It has already been established that the generation [of the world] as a totality cannot be compared with the generation of a particular thing in so far as it is a particular thing. It is evident that the generation of a man from a man is [a case of] particular generation in so far as it is the generation of a particular [substance], as we have already demonstrated. Moreover, this creation [of the world as a totality] is the effect of [God's will], not of nature. Accordingly, it is possible for the one [primordial] matter to be endowed by virtue of this generation with different characteristics ^r, as we have already demonstrated in the case of the heavenly bodies and their differences. In the human crafts, [however,] there is a specific kind of matter, since the artisan is external to the thing [to be made] and cannot give it the natural capacity to receive his will; rather he endows it with a particular shape if that matter can receive

this shape. However, God -whose creative activity extends to all parts of the thing, as does the creative action of those natures that are caused by Him [i.e., the separate intelligences] -- has the power to endow the thing with a nature to receive His will. You can understand this great receptivity of matter to the activity of the Separate Form [i.e., Intelligence] by observing what happens in the creation of animals, where the [sub-lunar] matter is so remarkably put into motion that from it are selected whatever is fitting for making the various limbs of that body.

The level [of creativity possessed by] God relative to other separate agents [i.e., the Separate Intelligences] which emanate from Him is in this respect similar to that of the first leader of the virtuous state, as described by Plato. Plato places some men of that state in such a condition that they do [only] one of the various crafts needed in that state; he doesn't give them the capacity to do another craft but prevents them from doing this, since it is not proper for a craftsman to engage in two crafts,

-340-

as Plato [explicitly] says. ¹⁵ He does endow them with a principle whereby this skill can emanate from them to others in so far as they teach ^s this craft to others. In this manner he makes some of them builders, some carpenters, others weavers, etc., such that all the crafts requisite for the perfection of the state are provided for. Now, it is from the head of the state that all these crafts originally emanate; afterward they are disseminated by each craftsman. Analogously, from God emanate all things originally, and He gives them the capacity by virtue of which each creature can generate its own kind (e.g.^t, a man from a man, a horse from a horse). In addition, God has prepared for this generation the agents from amongst the heavenly bodies and the Agent Intellect.

Now, just as each earthly thing receives uniformly the will [i.e., influence] of the agent form -- since its activity spreads throughout each part of the sub-lunar matter according to the [power] given it by the agent, i.e., Agent Intellect, which is the giver of forms of all earthly substances -- so too does the matter receive throughout [all of its parts] the will of a form whose activity is not restricted to any particular part of the matter. In this regard nature is [arranged according to] different levels ^u. For in the case of a form which has a unique specific matter correlative to it, this matter alone receives the will [of this form], and in a most extraordinary way, as can be seen in the natural and voluntary movements of a man. This remarkable receptivity of matter to form in these movements can be seen, [for example], in the perfection of the nutritive system and in the other natural motions needed by the organism for digestion. For the form is remarkably able to move the matter in digestion ^v such that [for example] the form can transform the food into the essence of the organism by selecting from it what is appropriate for each limb and each part of that limb. In a similar manner, the receptivity of matter to form in voluntary motions can be understood. For you find that a man sings a song and moves the air in his vocal chords by means of marvelous movements without considering how to produce in each part of the vocal chords the various sound pitches. Rather, he conceives the subject of the song and from this conception the vocal chords are moved in this remarkable manner. But the case of a form whose activity is not ^w restricted to a particular matter, as in the case of the Agent Intellect, all

¹⁵In his *Republic* Plato sets forth a political theory whereby the perfect state is constituted and regulated by the principle that each person is by nature capable of doing only one craft. This idea is expressed in his famous "myth of the metals" (*The Republic*, III, 414-15). However, Gersonides' account of this doctrine differs in an important respect from the original. Whereas for Plato the ruling class is almost always described and referred to as a plurality -- the guardians, for Gersonides the guardian is a *unique* person -- "the head of the state" (*ha-rosh*

ha-rishon bemedinah). It is not too difficult to see why he makes this change: since he wants to make an analogy between this guardian and God, Gersonides needs to keep the former in the singular.

-341-

the matter ^x to which its activity extends receives the will of the agent in a more extraordinary manner than [the way in which] a particular matter receives the will of a particular form. Now in the case of an agent form to which no ^y particular part of being is assigned [for its activity] but whose activity extends throughout all being, as in the case of God, all the matter receives its will in a much more extraordinary manner than when sub-lunar matter receives the will of the Agent Intellect. And herein lies the solution to this difficulty. ¹⁶

Reply to eighth objection. This difficulty is rhetorical. The upward and downward directions are not the result of the mathematical dimensions in the [primordial] body, but the result of particular things in it. Those [bodies] that are light move upward; those that are heavy move downward. But if there are no light or heavy [bodies], there is no upward or downward direction. In general, there is no upward or downward direction without a circular body with circular motion, as has been demonstrated in physics. [Now], if this [primordial] body has no nature at all [i.e., light or heavy], it is obvious that there is no surrounding limit nor elements in it; and hence there is no upward or downward direction.

Reply to ninth objection. This difficulty can be easily solved on the basis of what we have already said. If God had created the universe for some personal advantage, then this objection would be appropriate. But since we have demonstrated that God did not create the world for any advantage to Him but out of goodness and compassion, creation is to be attributed solely to His will.

Now someone might object that since God's existence is eternally the same, His will is eternally the same; so that if we were to posit that He would desire something one time and not desire it another time, He would then be subject to change. Our reply is as follows. The nature of the material principle requires that the good inherent in it possess a definite temporal beginning, since this good necessarily derives from something other than itself, as has been explained. ¹⁷ Consequently, the world is created. If this is so, it is obvious that this goodness in the material principle derives from God; and the reason why it does not exist eternally in it is the intrinsic deficiency of this principle, which requires the existence of goodness in it to be created. If this were not the case, the good in this principle would not be the result of the activity of an agent,

¹⁶As Touati notes, this example of the singer who sings so easily without needing to reflect upon the mechanics of sound production is one of several such examples that Gersonides likes to employ in order to illustrate the beautiful and harmonious relationship between mind and body, form and matter (Gersonides, *The Wars of the Lord*, vol. 2, Bk. 3, chap. 4, p. 119. Touati, *La Pensée*, 259).

¹⁷Answer to third objection.

-342-

as has been explained. But this hypothesis has been shown to be false. For this reason the world must have had a definite temporal beginning.

Nor is there any point to the question why didn't God create the world at a preceding instant; since if He had created it before this moment no matter by how much, the same question could still be asked. Moreover, just as God is not conceived as omnipotent such that he can create something having two simultaneous contrary properties -- for the nature of the recipient excludes this possibility -- so too God cannot be described as having the power to endow the primordial body, from which the world is created, with eternal goodness; for the natural deficiency of this body requires that its goodness be created. We shall discuss this point in greater detail in our investigation of Aristotle's arguments in favor of the eternity of the world. ¹⁸

On the basis of what we have just established we can explain how the various forms given by God to the heavenly bodies have been created without any preceding motion. The act of generation in them is really a change from their lack of a definite shape to the possession of a definite shape. Since this kind of generation is from non-being to being there is no motion or change, for change is from one contrary to another contrary. ¹⁹ Moreover, it has already been demonstrated that there was no

¹⁸Infra, chaps. 20-8.

¹⁹The primordial body exists in some sense; but its level of being is so "low" that it can be considered as virtually non-existent, or a non-being (Gersonides' view of the nonsubstantial character of the original matter is similar to the concept of matter in neoPlatonic philosophy, where matter, because of its essential imperfection, is almost nothing [J. Rist, *Plotinus: The Road to Reality* (Cambridge University Press: New York, 1977), 117-18, 127-28]). Accordingly, since creation is literally for Gersonides the "*in-formation*" of this formless matter into something formed, we have here the generation of being from nonbeing. In Aristotle such a change is categorized as "genesis", an "unqualified coming to be" from one contradictory, non-being, to the other, being. Aristotle himself admits in this context that this change is not motion, that *genesis* does not involve movement (Aristotle, *Physics*, V:1, especially 225a.12ff). On the other hand, changes from one contrary state, e.g., the green color of an apple, to another contrary, e.g., the red color of the same apple, is a case of accidental change, and here motion is involved (Ibid, 225b1ff).

Gersonides' terminology here differs from Aristotle, but in some respects his conclusion is similar. Although he says that genesis does not involve either change or motion since it is a coming into being from non-being, which are contradictory conditions, he wants, however, to defend the thesis that genesis is the most basic, or primitive, type of action. Indeed, he claims that the act of creation is the *primary motion*, albeit a motion radically different from locomotion, qualitative or quantitative change. Ironically, Aristotle claims that locomotion is the primary form of motion (*Physics*, VII:2. 243a10), yet in his discussion of genesis he admits that there is a type of change that is even more primary than locomotion. This is precisely Gersonides' point! This point eluded Aristotle, Gersonides could have argued, because his Unmoved Mover has no will, whereas the primary act, and hence the primary change, is *willing the world* to exist (Aquinas, *Summa Contra Gentiles*, II:17). Touati notes that in his Commentary on *Averroes' Middle Commentary on the Physics* Gersonides claims that the notion of motion in generation is only a metaphor (Touati, *La Pensée*, 264, n.116). *In his polemic against the eternity of universe Philoponus makes the same point: creation is a unique act, not involving change or motion as ordinarily construed* (J. Philoponus, *De Aeternitate mundi*, III:3, pp 48, 25-49, 5; IV: 3, pp. 64, 10 - 15; IV: 6, p 67, 20 - 68, 18).

motion prior to the generation of the universe. Thus, the motion of generation precedes all kinds of motion. ²⁰This is fitting; for since the [various] motions of a thing derive from the [nature of] its generation, its generation should be prior to its motion. Thus, you find also in particular generations that their motions are posterior to the [initial] motion of generation in them. However, it happens that their [own] generation is necessarily preceded by some [other] motion, since this is a case of particular generation ². Hence, the universe must already be in existence containing beforehand the causes of that particular generation; and this cannot be from the whole [universe] unless through motion. This is evident to those who are familiar with the natural sciences and with our treatise. ²¹

²⁰Gersonides, *The Wars of the Lord*, Bk. 6, pt. 1, chap. 8.

²¹In his essay "Gersonides on the Problem of Volitional Creation", M. M. Kellner raises several interesting philosophical questions concerning some of the issues treated in this chapter [M.M. Kellner, "Gersonides on the Problem of Volitional Creation", *Hebrew Union College Annual*, 51 (1980), 111-28].

CHAPTER XIX

IT is now appropriate to examine with the premises at our disposal if a plurality of co-existing ^a universes is possible, since we have already demonstrated the impossibility of a plurality of successive universes. But first we must excuse ourselves for embarking upon such a difficult inquiry, since there is an aspect to this question that prevents us from attaining a complete answer to this inquiry. Since the [primordial] body from which the universe is created is itself not produced by an agent, we cannot know whether or ^b not enough matter remains [after creation] for the production of another world. ¹This is obvious. Yet there is a way that can lead us to a proof with respect to this question: either from the aspect of the agent; or from sense-data, if it is possible to extract from them the begin.1, 2ing of a proof on this subject, as was possible in the case of our universe. For, from what can be empirically demonstrated from its existence ^c we know that the primordial body had to be of [sufficient] quantity that our universe could be generated from it. Thus it is proper that we consider this topic as best we can; for human happiness is indeed attained when we know as much as we can know of ^d a particular thing. ²

¹It should be noted at the outset that Gersonides' proof for the unicity of the universe differs from Aristotle's proof in at least one important respect. Several of Aristotle's arguments presuppose the doctrine that there is no surplus matter. From this proposition he infers both that there is no other universe than this one and that there is no void outside of this universe (Aristotle, *On the Heavens*, I:9, 279a 5-17). Since Gersonides is inclined towards the view that there is matter outside the universe, as we have seen, his argument differs considerably from that of Aristotle, although he does accept the twin conclusions that there is no void outside the universe and that there is no plurality of worlds. The thesis of a coexisting plurality of worlds was advocated by the ancient Epicureans (Lucretius, *On the Nature of Things*, Book, II, ll.1052-66, 1077-89; Steven Dick, *Plurality of Worlds*, (Cambridge University Press: Cambridge, 1982), chap. 1).

²The question of the possibility of a plurality of co-existing universes was widely debated in the fourteenth century, especially amongst the Latin Scholastics. Nicholas Oresme, for example, maintained that such a plurality is indeed possible [Nicholas Oresme, *Le Livre du ciel et du monde*, ed., and trans., A. Menut and A. Denomy (Madison, 1968), 165 ff]. This topic was intimately connected with the issue of possibility of a vacuum outside the universe [

A. Koyré, "Le vide et l'espace infini au XIV siècle", *Archives d'Histoire Doctrinale et Littéraire du Moyen Âge*, 24 (1949), 45-91]. E. Grant, "Medieval and Seventeenth Century Conceptions of an Infinite Void Space beyond the Cosmos", *Isis*, 60 (1969), 28-60. S. Dick, *op. cit.* chaps. 2-3. P. Duhem, *Medieval Cosmology: Theories of Infinity, Place, Time, Void, and the Plurality of Worlds*, ed., and trans., Roger Ariew (University of Chicago Press: Chicago, 1985), part V.

-345-

Now, of the [primordial] body, whose existence has been proved, necessarily either [all of] it is in one place only or [discrete parts of it] are found in many places and between these places there is absolute privation.³ It would seem that the latter alternative is unlikely; for a plurality cannot obtain in what exists accidentally, since accidental phenomena are rare, as is evident from their very nature.⁴ Moreover, if the latter alternative were adopted, a vacuum would result, and this absolute privation [or vacuum], would have a [definite] magnitude and divisibility, and its parts would be in relation to each other. But this is clearly absurd, as I shall now demonstrate. Let us postulate a body A and another body^e B; then imagine on the surface of one of them a line AC and on the surface of the other a line BD and that these lines are the limits of these bodies such that between them there is absolute privation. (It is evident to anyone a bit familiar with geometry that we can make these two lines in the same plane). Now these lines are necessarily either straight or curved. If they are straight, they are either parallel or oblique. If parallel, each of their parts would be equal in distance from each other. But the distance [i.e., interval] between these lines is absolute privation, [i.e., a void,] and thus one privation would be equal to another, which is obviously absurd; for equality and magnitude^f are [properties] of existing things only. On the other hand, if these lines were oblique or curved, the distance between the lines would be greater at one place than at another and one part of the absolute privation would be larger than another part, which is utterly absurd. In addition, it would also follow from this that privation would be [indefinitely] divisible, since an interval is necessarily divisible. But all of this is false.⁵ It is therefore evident that it is proper for this [primordial] body to be situated in one place only.

But if this is the case, I say that there should be only one universe. For [on the hypothesis that there are many universes] the body that is

³Gersonides envisages the thesis of the plurality of universes in terms of his theory of primordial matter. The latter, however, can be interpreted as being discrete, i.e., occupying several places, or as occupying one continuous region. On the former interpretation, the various portions of matter occupying different regions constitute different worlds and are separated from each other by empty space. On the latter interpretation, some regions *within* the primordial matter are the loci of different universes and each such universe is separated from another by this formless matter. From each supposition Gersonides will now draw untenable conclusions.

⁴As Touati correctly remarks, Gersonides' point here is "laconic." Why should a thing that occurs by accident, or chance, not be many? Keep in mind that the primordial body can be said to be "accidental" since it is not the product of an agent. Now that which is accidental, Aristotle insists, is infrequent. (Aristotle, *Physics*, II:5-6). So if the primordial body had been in more than one place, it would not have been in *many* places (Touati, *La Pensée*, 287).

⁵I. Efron, *The Problem of Space in Jewish Medieval Philosophy*, (New York, 1917), 75-76.

-346-

between these universes would either preserve its shape or not preserve its shape. ⁶If it were to preserve its shape, it would move along with the motion of the universe it surrounds. ⁷Similarly, all these universes would move by virtue of the motion of any one of them. For this body that is between them would be in motion in its entirety because of the motion of each one of these universes; and with its moving ⁸ it would carry the universe that it surrounds, from which there would accrue to these universes a confused motion. Moreover, a vacuum would result from this [confused motion]. ⁸This whole hypothesis is absurd by virtue of all the falsehoods which it entails, so that there is no need to expatiate on this point any further.

⁶Gersonides has just shown that the primordial matter is in one continuous extended region. Now, the hypothesis of a plurality of universes must be construed as saying that *within* this primordial matter several worlds exist, each separated from the other by a region of the primordial matter; for there cannot be any empty space between these universes. Gersonides now raises the question, what is the topological character of this primordial body between these several worlds?

⁷Bodies with definite, or regular, shapes can have regular motion.

⁸The inter-spherical matter was introduced by Gersonides *to prevent the movements of the spheres from interfering with each other*. Not preserving its shape or form, this matter cannot as such move or transmit motion (Touati, *La Pensée*, 249-55). *But if we were to assume that this matter does preserve its shape, it would then be capable of motion, and hence would not prevent the motions of the various spheres from interfering with each other, which is contrary to Levi's astronomy.*

*Levi's additional statement that this hypothesis leads to the existence of a vacuum is, however, not obvious. Suppose a system in which there are several sub-systems, or bodies [e.g., spheres or worlds] moving in a rarified fluid or gas. It is not clear why a vacuum would result from such a hypothesis. Jacob Staub suggests that a vacuum would result because the various bodies or worlds would need "room" to move [J. Staub, *The Creation of the World According to Gersonides*, (Chico, 1982), 60]. This was the doctrine of the ancient atomists, especially the Epicureans. But it was rejected by Aristotle, who believed that motion is possible in a plenum, i.e., without any empty spaces (Aristotle, *Physics*, IV:6-9).*

It is possible that Gersonides' elliptical allusion to the existence of a vacuum on the hypothesis of plural universes within the matter that doesn't preserve its shape is a faint echo of a scholastic debate which was beginning to heat up after the 1277 Condemnation of 219 Propositions. One of the condemned propositions was the thesis (#66) that God could not move the heaven in a straight line because He would then leave a vacuum. As Duhem, Koyré, and Grant have shown, the debate concerning the plurality of worlds was intimately connected with the question of the vacuum (see note 2). Those who believed that a vacuum is utterly impossible were led to deny that God could move the universe in a straight line, for such rectilinear motion would constitute a displacement, and thus the place that the universe had originally occupied would then be left empty. Now consider Gersonides' case. If the imagined plural worlds were lodged in the primordial body, which is now regarded as capable of motion, then these worlds would, Gersonides contends, all be moving in a "confused" manner. We have regressed to Plato's theory of the "disorderly motion." In a state of irregular, confused motion each world would be displaced from its "proper place", thus creating a vacuum where it had been originally situated.

But if this is the case, then.1-350 this matter must not preserve its shape, as is the case with the body [now] between spheres. But if this is so, then ^h since this body is transparent (as is evident from its nature), it follows that the heavenly bodies in those universes on our horizon should be visible to us and that sometimes two or more moons in those universes should also be visible. Moreover, it would be the case that [our] moon would not suffer any increase or decrease in its illumination in terms of its distance from the sun in our world; for it could [on this hypothesis] receive light from the suns ⁱ in the other universes as well! Furthermore, the fixed stars in those universes should also appear to us extraordinarily larger at one time than at another in proportion to their distance from us. But the fixed stars do not exhibit such a property! Again, the stars in these universes should not always have the same distance to the fixed stars in our world. But all of this is contrary to what is evident from the observations we have concerning the fixed stars; for all of them always have the same distance according to the information ^j about the celestial domain that has come down to us throughout this long period of time. Moreover, it would follow from this hypothesis that many of the heavenly bodies which are visible to us should be eclipsed by these other universes, when the earth in one of these universes would be between our vision and the heavenly bodies. If someone were to object that the bodies in the other universes are not visible to us because of their great distance from us, we say that this should not be true for *all* such bodies; and the difficulty about the moon in our universe would still remain for this hypothesis. In short, if we were to enumerate all the absurdities that this hypothesis entails according to astronomical science, we would require a long discussion; what we have mentioned is sufficient.

[Finally,] if someone were to object by arguing that this body [between the many worlds] is not transparent, and hence, these difficulties do not follow, ⁹ we reply as follows. If we were to admit this difference between the [non-transparent] body that doesn't preserve its shape [between the various universes] and the [transparent] body that doesn't preserve its shape between the spheres, another difficulty would arise that is no less severe than before. If the former body were non-transparent, we would find that it would still receive light. If this were so, it would continually receive light from the sun in its entirety and hence continually emit ^k a tremendous amount of light. But this is obviously false.

⁹Since this "inter-cosmic" matter is not transparent, we shouldn't expect to see the planets in these other worlds.

Furthermore, [let us now consider the hypothesis of a plurality of universes from a different point of view.] Since these worlds would have to agree in name and definition with our universe (as we have seen), ¹⁰ the mover of the sphere of the sun, in one such universe, for example, would have to be the same in species as the mover of the sphere of the sun in another universe, and similarly with all the other movers in the various universes. Now separate forms that agree in species cannot be numerically many; for diversity accrues [only] to a material form ^l by virtue of the matter to which it is attached. Accordingly, one [i.e., separate] form [e.g., the mover of the suns in every world] would be the form of many bodies in the sense that it would be attached to all of them in an essential way such that it gives life to each ^m of them. But this is clearly absurd! It would be possible, however, for the action of a separate form to reach many objects if this form were not attached to them essentially, as is the case with the Agent Intellect and things in the sub-lunar world. Moreover, unity is nobler than multiplicity. Hence, unity amongst things derives from the form, whereas plurality results from the matter. And since the activities of God are properly directed towards what is noble, it is evident that there should be only *one* universe.

[11](#)

Furthermore, we find that the pluralityⁿ in individuals exists only for the preservation of the species. [Thus,] amongst indestructible things there is^o no individual plurality. For example, it is necessary that there are many individuals within the human species; for if there were only one individual, he could die before procreating, either because his part of the Earth is destroyed or because of some other cause. Similarly, it is possible that this [one] individual be sterile, and the whole human race would in this manner vanish.

In addition, the human species [in particular] needs plurality since its preservation requires many different crafts. It is for this very reason that individual plurality in the human race is distributed^p throughout the entire inhabitable [part of the earth]. For if there were no such plurality in the human species, it could happen, by virtue of the natural propensity to congregate for the satisfaction of mutual human needs, that all people would be located in one place, and if this place would happen to be destroyed, the whole human species would vanish. Hence, it is necessary that a plurality spread throughout the entire inhabitable part of the Earth so that the human race survives. ¹²For these reasons (or at least

¹⁰Gersonides, *The Wars of the Lord*, Bk. 6, pt. 1, chap. 8.

¹¹Aristotle, *Physics*, VIII: 6-7. Aquinas, *Summa Theologiae*, I, q.47, a.3.

¹²For this reason Gersonides believes that the splitting up of the people of Babel after they had built their tower to the sky was not a curse, but a blessing! See his *Commentary on the Torah*, 22a.

-349-

for some of them) it is [also] necessary that plurality exist amongst the other species in the way that it does. Furthermore, since the other species exist for the sake of man, either for his sustenance or as a source for his labor, it is necessary that these other species be sufficiently diverse [in both kind and number] for the [satisfaction] of man's needs. Now, since it has been shown that individual plurality exists only for the preservation of the species, and since it has been previously demonstrated that the universe cannot be destroyed, ¹³it is evident that there cannot be any^q individual plurality amongst universes. And so it has been proved that there cannot be a plurality of universes, either existing simultaneously or successively. ¹⁴

¹³Gersonides, *The Wars of the Lord*, Bk. 6, pt. 1, chap. 16.

¹⁴This discussion of the problem of the plurality of universes should be compared and complemented with that found in Gersonides' supercommentary on Averroes' commentary on *On the Heavens*. There he is critical of Aristotle's scientific proofs and favors the metaphysical proof of *Metaphysics*, XII: 8, 1074a 31-38, which is the argument based upon the impossibility of a plurality of separate forms for a set of similar heavenly bodies (e.g., the case of the plural suns cited by Gersonides).

-350-

CHAPTER XX

NOW that we have explained the nature of this universal creation and have resolved the various objections that have been leveled against this thesis -- it being clear that Aristotle's arguments on behalf of eternity are [really] objections to that which has been proved with respect to this creation ¹-- it is appropriate that we investigate these objections more completely, so that there remains no room for controversy or the possibility of rejection [of this view]; for these are the

ear-marks of perfect knowledge. We have already mentioned these arguments; now we shall examine them individually in separate chapters.

Aristotle's first objection is taken from the nature of time. He maintains that from the very nature of time it would appear to be infinite, since it is impossible to conceive of time as generated and as passing away. Anyone who assumes this ^a is committed to the view that there is a time existing before its own generation in which time is generated and a time existing (simultaneously) with its own passing away in which it passes away. For all that is generated is generated in time and all that passes away does so in time. Aristotle claims that this proposition was agreed upon by all the ancient philosophers. ² He also contends that whoever makes time generated is committed to the prior existence of time, since that which is generated exists *after* it was non-existent; hence, time would be non-existent ^b*prior* to its existence. But when we use the term "before" [we imply] time, since "before" and "after" are the divisions of time. Thus, time would necessarily precede its generation. Analogously, it is impossible for time to pass away. For if it could pass away, it would be non-existent *after* it had existed, and when we say "after" [we imply] time; hence, time would exist after its passing away. Accordingly, it follows that time neither is generated nor passes away. [Furthermore,] since time is one and continuous, as appears from its nature, and since it cannot exist without motion, it is necessary that there be a motion that is continuous, unitary, and eternal. For contiguous motions cannot generate continuous time; hence from them *infinite* continuous time cannot be derived. When, however, there is an eternal, unitary, and continuous motion, there is also one eternal moving body, since

¹That is, Aristotle's arguments for eternity of the universe are really *reductio ad absurdum* arguments against creation.

²Aristotle, *Physics*, VIII:1.

a unitary motion implies one moving body. This argument can be derived from Aristotle's views as set forth in his discussion of motion in the *Physics* and in book Lambda of the *Metaphysics*. ³ Now it should be realized that Aristotle was aware of the weakness of the proposition [in this argument] from which he concluded [that time is eternal] -- [viz.,] if time were generated, it would be generated in time -- therefore, he relies on the authority of others for the principle.

Now that we have stated this argument, it is necessary to examine it in detail according to the truth itself. It is clear that the issue in question, i.e., whether or not time is generated or passes away, is [equivalent] to the question whether time has a beginning or an end, i.e., whether or not there is a first instant from which time begins and there was no preceding time, or a last instant at which time ends and there will be no time after it. Once it is proven that this is impossible, it follows that time is infinite both in the past and in the future.

However, if the meaning of this [principle] concerning the generation of time [i.e., whatever is generated is generated in time] is that a part of time is generated, i.e., time is [already] present, then Aristotle's argument is invalid. For even if we were to admit that a part of time cannot be generated simultaneously [with other parts], ⁴ as is evident from its nature, it would not follow from this that time [itself] has no beginning. Similarly, it does not follow from the fact that no part of time passes away simultaneously [with other parts] that time has no end. For this would be true on the hypothesis that time is not eternal as well as on the hypothesis that it is eternal. It does not follow from this that time existed prior to the generation of any part of time. For when time is generated in this manner, it is not generated in any previous time. This hour, for example, is not generated in an hour earlier than it; rather, it is generated in the time that is being

generated ^c with its generation, so that the generation of an hour takes place in an hour, and the generation of a halfhour in a half-hour. In the same way it can be shown that the passing away of an hour does not take place in an hour after it; rather it occurs progressively in that hour. Now when it has been shown that it does not follow from this that time existed before its generation or after its cessation, it is evident that Aristotle's inference is invalid, if he understood the generation or passing away of time as referring to the generation or passing away of a part of it. ⁵

³Aristotle, *Physics*, IV: 12-14, VIII: 1-2, 6-8; *Metaphysics*, XII: 6-8.

⁴A part of time (e.g., an hour) is generated minute by minute, not all at once.

⁵Let us assume for the sake of argument Aristotle's principle that whatever is generated is generated in time. From this principle Aristotle concluded that time cannot have a beginning or end. In his response to this argument Gersonides initially wards off an interpretation of this principle that looks quite plausible -- the generation of a part of time presupposes the existence of time itself in which the coming about of this part takes place; similarly in the case of the passing away of a part of time. This reading of Aristotle's principle would, Gersonides claims, render Aristotle's argument invalid. Even if it is true that every part of time is generated successively, e.g., minute by minute, it would not follow that time itself has no beginning, i.e., that it cannot be generated at *one* instant. The generation and passing away of the parts of time are clearly not simultaneous, e.g., an hour takes an hour to come about and to pass away, i.e., it doesn't come about and pass away *all at once*. But this point is irrelevant to the question at hand: it doesn't imply that for every part of time to be generated there must be an antecedent time. The generation of an hour, for example, takes place in that very hour, not in another hour that pre-exists it. Accordingly, if it were alleged that time itself had a beginning, it wouldn't follow from Aristotle's principle that there had to be an antecedent time in which time is generated. For whether we are talking about the generation of a part of time or of time itself, the generation begins with and in the first moment of that magnitude, either of the part or of the whole and then continues progressively and successively throughout the interval or the whole of time. Thus, even the defender of the creation of time (e.g., Plato and Gersonides) can accept Aristotle's principle as long as it is construed as saying only that time is generated successively in the time that it lasts.

On the other hand, our assumption that a part of time is generated in that time which is generated by its own generation and that a part of time passes away in the time that it takes to vanish does give rise to a serious difficulty. For the time in which this part of generated time is generated is itself generated together with the emergence of that part, i.e., two times are generated simultaneously. Therefore, the second time should also be generated in a third that is generated along with it, and the third should be generated in a fourth, *ad infinitum*. Consequently, there would be an infinite number of times all simultaneous with each other. But it is false that there could be two simultaneous time-series; it has been proven that by its very nature time is free in some sense from matter, and therefore does not multiply with the multiplication of movements. ⁶ All the more so is it impossible for there to be an infinite number of simultaneous time-series. ⁷

This difficulty can be removed if we say that the time in which time is to be generated is ^d not completely different from the time that is generated. Rather it is the same as the latter in one respect, although different from it in another respect. Since the time that is being generated is generated little by little, all of its parts exist necessarily in the whole ^e [of that portion of time], since the parts of this time cannot be contained in anything less than this time. Thus, when we say that the generated portion of time ^f is generated in time, we mean that its parts are contained

in the whole [interval], just as we say that eight spans are in a measure. Thus, when we say that an hour is generated in an hour, we simply mean

⁶Although there can be many instances of motions, there is only one time.

⁷Aristotle, *Physics*, IV: 14. Gersonides, *The Wars of the Lord*, Bk. 6, pt. 1, chap. 10.

-353-

that all the parts of the hour are not contained in anything less than a whole hour; for it is impossible for these parts to be simultaneous, and so they are successive. But if they are successive, they must exist in a time equal to the [time] of all its parts. Therefore, it is evident that there is no second time here which is completely different from the time that is generated, although it is different in the sense that the whole is different from its parts.⁸

After having removed this difficulty let us now determine whether there was an instant at which time began or if it is necessary that this instant be generated in a preceding time, [as Aristotle contends]. We have already explained that this is the crucial question, not the generation of a part of time. We shall also consider this very question with reference to the passing away of time [i.e., the possibility of a last instant].

I claim that it is not necessary for everything that is generated to be generated in time. The change that is generated in a particular changeable object is generated in no-time, as Aristotle himself points out in the *Physics*. For there is no intermediate state between the change and the *terminus a quo* of the change, and thus it is clear that there is no intermediate state between the change as a whole and its *terminus ad quem*. Thus, change is in no-time.⁹ Now this being the case with change, and time being an accident inhering in change and generated along with it, as Aristotle has explained, it is evident that if time is generated it is generated in no-time. Similarly, if it passes away, it does so in no-time. But this is contrary to Aristotle's conclusion in this proposition. We are referring in this context to changes in motion, qualities, magnitude, or place.¹⁰

Furthermore, it can be shown from the nature of time that if it is generated, it is not generated in a time prior to its [own] generation. Something that is generated in time is such that its generation is either a change or something consequent upon a change. In either case, prior to

¹⁰Wolfson, *Crescas' Critique of Aristotle*, 498-521, 542-45.

⁸In this complicated discussion Gersonides accepts for the sake of argument Aristotle's doctrine that whatever is generated is generated in time and shows that it does not lead to a coexisting plurality of time-series; for the phrase "in time" is to be understood merely in the sense that the generation of a portion of time occupies time, i.e., has parts, whose totality constitutes the whole portion. The time in which the generation of a temporal stretch takes place is then simply the stretch considered as a whole having sub-parts that are successively generated. The whole interval is constituted by these sub-parts and is in this sense "generated in" these sub-parts (Touati, *La Pensée*, 233).

⁹Aristotle, *Physics*, V:1 and VI: 5 - 6. Thomas Aquinas, *Summa Contra Gentiles*, Book II, chapters 17 and 19. There is here a divergence between the manuscripts consulted and the printed editions: the former read



whereas the printed editions omits



Although both readings make philosophical sense, I adopt the reading of the printed editions. (I owe this suggestion to Professor Alfred Ivry of New York University).

-354-

its generation there is necessarily a change at the end of which it is [itself] generated. The time^g in which it is generated is that which is between the *beginning* and the end of that change. This principle is self-evident to anyone familiar with the sciences. Now when this principle is fully appreciated by us i.e., that with respect to anything that is generated in time, prior to its generation there is a change at the end of which it is [itself] generated -- it follows by contraposition that whatever is not preceded by a change at whose end it is [itself] generated is not generated in time. But it is evident that the generation of time is not preceded by a change at the end of which it is [itself] generated; for time is necessarily co-existent with the beginning of the change, since it is present along with the presence of the moving body, no matter which kind of body or which kind of motion. Therefore, it is clear that if time is generated, it is not generated in time. In this manner it can be demonstrated that if time passes away, it does not pass away in time that exists subsequent to it; for it does not pass away until the termination of the change that precedes its passing away, if it is the case that the passing away of time is a consequent of change. It has, therefore, been indubitably demonstrated that it does not follow if time is generated or passes away that this occurs in a time before or after it. Indeed, the contrary of this principle is true, as we have just proven. ¹¹

Indeed, Aristotle's argument that time, on the hypothesis of its being generated or passing away, must precede its creation and exist after its cessation because of the necessary use of such terms as "before" and "after" in temporal discourse is actually very weak. When we use these terms "before" and "after" in this context we use them equivocally with respect to the terms "before" and "after" [referring] to the differences in time. In fact, this same objection can be leveled against Aristotle when he claims that the universe is finite in size. For he says "There is there^h beyond the universe no vacuum or plenum." Hence, he says, "There is there no place". ¹² Now it is clear that in saying "beyond" we refer to a

¹¹S. Feldman, "Gersonides' Proofs for the Creation of the Universe," *Proceedings of the American Academy for Jewish Research*, 35(1967), 133-35.

¹²Gersonides' argument here hinges upon several linguistic turns that are not easily reproducible in English. The philosophical point is fortunately not difficult. If Aristotle prohibits the creationist from saying "*Before* the universe was created there *was* no time" because the use of "before" and "was" imply the antecedent existence of time [Aristotle, *Physics*, VIII:1, 251b 10], then by the same token Aristotle is prohibited from saying "there is no void or plenum outside the universe" or "*beyond* the universe *there* is no place or body" [Aristotle, *On the Heavens*, I:7, 275b-8-11, I: 9, 270 17; *Physics*, IV:5, 212b 17-18]. Gersonides' citations from Aristotle however, are not exact quotations; they introduce a Hebrew term that does not appear in the Greek texts and that he exploits for philosophical purposes. It is the term *sham*, "there". This term has an obvious spatial connotation wherein it is used indexically to denote a particular place or region; e.g., "there is the book", i.e., it is in back of you. In his argument against Aristotle, Gersonides claims that whenever Aristotle makes a claim about the absence of a vacuum, plenum, place, or body outside the universe, he uses a spatial locution, i.e., "there", which he is strictly speaking not entitled to use, or at least no more entitled to use than the creationist is when the latter uses words like "before". Although my literal renditions of Gersonides' citations are awkward in English, they are needed to bring out the full force of his argument.

place, as we do when we use the term "within". Analogously, the term "there" in this proposition necessarily connotes place, even if this term can be used in a way not connoting place. For, just as when we¹ say "There is there a plenum" the [second occurrence of] "there" necessarily connotes place, so too in our saying "There is there no plenum" the [second occurrence of] "there" necessarily connotes place. The predicate and subject of a proposition retain the same meaning whether the proposition is affirmative or negative; otherwise, there would be no opposition between affirmative or negative propositions, as has been proven in Aristotle's *On Interpretation*.¹³ In general, the meaning of the predicate or subject does not change because the proposition is affirmative or negative, as is evident. Now if this is so, he who asserts that the universe is finite in size is asserting a statement that is self-contradictory. For he is saying "There is there beyond the universe neither a void nor a plenum". Now, the terms "beyond" and "there" necessarily connote place, as we have seen. And if there is place there is also a body, since there is no place without a body. Similarly, it would be implied [by this sentence] that beyond that body there is another body, and this could go on infinitely. It is clear, then, that someone who asserts the finitude of the universe necessarily asserts the infinity of the universe simply by virtue of the terms he uses, since there is no way of avoiding using these words. It is evident, therefore, that in all these contexts the terms are not used in their common senses, since the intention in these contexts is to connote absolute privation, [i.e., no void, no plenum]. This is the case with the terms used in the hypothesis of the generation or passing away of time, as well as in the case of the hypothesis of the finitude of the universe.

Moreover, languages are conventional, as we have previously demonstrated.¹⁴ Hence, it is no objection against us if the language does not provide a [specific] term to connote some negation; for it is not necessary to use it [i.e., language], reality being as it is.¹⁵ It is also evident that there

¹³Aristotle, *On Interpretation*, 7-8.

¹⁴Gersonides, *The Wars of the Lord*, Bk. 6, pt. 1, chap. 15.

¹⁵Gersonides has been arguing that philosophical truths are not always derivable from linguistic usages or from the richness or poverty of a language. If physics shows that the universe is finitely large, it is irrelevant that English or any other natural language has or doesn't have ordinary expressions to formulate this truth. Similarly, if Gersonides has succeeded in proving that the universe is finite in the past, it is no argument against this thesis to say that in the sentence "There was no time before the beginning of the universe" the use of the term "was" commits one to pre-mundane time, and thus time is really eternal. We can avoid this sentence and use a different formulation instead. Rather than language dictating to reality what it should be like, it is reality that mandates what true sentences a language should state. In short, the facts of the universe are what they are; it is our job to discover them, not to make them up, especially by misusing or abusing language (Professor Charles Touati has been helpful in the translation of this passage).

are things for which there are no names in a language; yet wise men refer to them with words used metaphorically according to some similarity. Accordingly, when we use such terms as "before", "after", "beyond" and "there", it is pointless to argue against us from ordinary usage; for we are [intentionally] departing from this usage. Hence, Aristotle's objection has been removed, and from this argument there are no grounds to conclude that time is eternal, neither in the past nor in the future. And this was our intention in this chapter.

CHAPTER XXI

ARISTOTLE's second argument is based upon the nature of the instant. The basis of his argument is as follows. From its very nature the instant appears to be the end of past time and the beginning of future time; for to say that there is an instant before which or after which there is no time is to utter something that defies human imagination. But if time were generated, there would be an instant before which there would be no time. Yet this is impossible, since the instant divides the before from the after, and the before and the after are the divisions of time. But if this were so [i.e., time is generated], it would follow that there would be time before the generation of time and this is absurd. ¹

Aristotle, I believe, strengthens this argument by a second consideration. He maintains that more than anything else the instant is similar to the point on a circular line. For, if the point is considered to exist in actuality, it demarcates in actuality either the end [of a segment of a line] or the beginning [of the segment] ^a. If, on the other hand, the point is considered to exist in potentiality only ^b, then it divides the line. In the latter case the point is both the beginning and the end, i.e., the end of the prior [segment] and the beginning of the posterior [segment]. Accordingly, since it is impossible for the instant to exist except in potentiality, and since the point qua potentiality is the beginning of the posterior and the end of the prior [segments], it follows [by analogy] that the instant is the end of the prior [segment of time] and the beginning of the posterior [segment]. ² That the instant can exist only potentially is evident. If the instant were to exist in actuality, it would exist in time and be divisible. ³ Moreover, it is impossible for any particular part of time to exist in actuality, since the very being of time is potential. ⁴ It is even all the more necessary to say that the instant exists in potentiality only, since a terminus, whether *a quo* or *ad quem*, exists only with that of which it is a terminus. Since, then, the time of which the instant is either the end or the beginning is itself only potential, the instant too must exist only potentially. This is the basis of Aristotle's argument on the nature of the instant. ⁵

¹Aristotle, *Physics*, IV: 11 and 13, VIII: 1.

²Hence, no instant could be the *first* instant, i.e., time is eternal.

³The instant is, however, indivisible (Aristotle, *Physics*, IV:10).

⁴Ibid., 217b 30-218a 8.

⁵Aristotle, *Physics*, 220a 5-11, 222a 10-18, 251b 10-28.

I claim that Aristotle's thesis that the instant must be preceded and succeeded by time, since the mind cannot imagine the contrary, is not necessarily [true]. For by parity of reasoning one could argue that *every* body must terminate at [or be encompassed by] another body outside it, since our mind cannot imagine a body that does not terminate at another body, as Aristotle has pointed out. ⁶ But if this is so, then the universe ought to be infinite in size -- which is false. In general, not everything that a man imagines is true, and men cannot imagine everything that is true. Indeed, there are true states of affairs that cannot be imagined, e.g., the termination of the universe in absolute privation, which is neither a vacuum nor a plenum [i.e., a finite but unbounded universe], and other analogous things. This particular analogy has occurred to us because we observe amongst the bodies around us that each body terminates in another body. Accordingly, we form an analogous belief with respect to time; for time seems to encompass us on both ends [i.e., before and after]. And so we can imagine the instant only as that which divides time. This argument is actually similar to the point we made in the previous chapter with

respect to Aristotle's argument about the terms "before" and "after", which we use [in temporal discourse]. This analogy occurs to the imagination in this way: we think that every instant has a before and after; because of this [analogy] we imagine that there must be time [before every instant], since the imagination cannot conceive of absolute privation. Rather it imagines a time preceding any given before and a time succeeding any given after. But we have refuted this argument in the previous chapter.

But if Aristotle infers that the instant is that which divides the before and after from the definition of time as a number of motion with respect to before and after (as it would appear from what Aristotle says on this subject ⁷) i.e., when an instant or instants are postulated the before is distinguished from the after (as has been explained the *Physics* ⁸), so that when we do not conceive of the instant we do not conceive of time, which would then seem to imply that the entire nature of the instant is to distinguish the before and after in motion and [in this way] motion is numbered ^c [i.e., measured] -- I maintain that it does not also follow from this that every instant must have a before and an after. For it is clear that it is the nature of time to measure motion as it progresses in a forward direction. It measures motion, however, only in so far as motion and any of its parts is [successive] not simultaneous; for whatever is simultaneous qua

⁶According to Aristotle's concept of place, the surface of every body is bounded by the surface of another body (Aristotle, *Physics*, IV: 4-5).

⁷Aristotle, *Physics*, 219a 13, 219b 2.

⁸Ibid., 218b 28-29.

simultaneous is not measurable by time, as is self-evident. Time measures motion with respect to the before and after in motion, so that there is no part of time that does not contain a before and an after *ad infinitum*, since motion is infinitely divisible. ⁹It is always the case that a division of motion yields a prior part and a posterior part. And since it is in this manner that motion is measurable by time, it is clear that if someone does not measure [motion] with respect to before and after, he is not measuring by means of time. All of this is sufficiently explained in Aristotle's *Physics*.

Accordingly, when we assert the generation of time, i.e., that there exists an instant that does not divide the prior and posterior in motion but rather is the [very] beginning of time, it is not necessary that we conceive of this [as occurring] in time; for there was no time at all [before this instant]. After that ^d first instant, however, this is necessarily so, for then time exists because of the forward progression of motion. It is evident that every instant after that [first] instant does divide the before from the after in motion as long as the motion continues to exist. Analogously, if time were to pass away, the last instant would not imply the conception of [this occurring] in time; for time would have already ceased to exist in this last instant, and the conception of time would have been completed in the moments prior to the last instant. Accordingly, it is evident that the instant which necessarily yields a conception of time is that which distinguishes the before from the after; but this is not necessary for the instant as such, since the instant that is either the beginning or end of time, if this is possible, does not necessarily yield an [accompanying] conception of time. Hence, it does not follow from this [i.e., the role of the instant in dividing time] that time is infinite. ¹⁰

We now see that in general the instant as such exhibits two aspects of reality: (1) it divides the before and the after; (2) and it demarcates a given portion of time or motion, e.g., a day or an

hour. A day, for example, is demarcated by the two instants that limit it, as in an hour. If the instant were nothing but a dividing point between the before and after in time, there would be no difference between three days or three hours; for the counting of instants in both of these temporal intervals is one and the same with respect to the instants that divide the before and after, since there are two instants in *each* of these [two] temporal intervals! The difference between these two intervals results, however, from the difference in the parts of these intervals; and the latter differ with respect to

¹⁰S. Feldman, *Gersonides' Proofs for the Creation of the Universe*, 133-37. Touati, *La Pensée*, 234-38. T. Rudavsky, "Creation, Time, and Infinity in Gersonides", *Journal of the History of Philosophy*, 26 (1988), 31-33.

⁹Aristotle, *Physics*, 234b 10ff.

-360-

^e each of these intervals. The distance between the two instants that demarcate a day is greater than that between the instants demarcating hour. It is, therefore, clear that the instant has two modes of existence: (1) it is that whereby a number [of motion] is generated [i.e.,] it is the division of the before and after [in motion]; (2) or it is a limit of a continuous quantity, i.e., it is the demarcation of a part of time. Because of these two aspects time exhibits features of both discrete and continuous magnitudes. For we say that time is great or little or that time is long or short: when we say of time that it is great or little, it is because of the number of instants that divide the before from the after; whereas when we say of time that it is long or short, it is because of the distance between the instants that demarcate that [particular] temporal interval. ¹¹

The situation with respect to the instant is similar to the case of the point. The latter also exhibits these two modes of reality: that is, (1) the point delimits a line by means of the terminating points, and (2) it measures the line in so far as it divides the prior from the posterior in the line. It is proper that in these respects these two cases are analogous, since the existence of the instant is generated from the existence of the points in the distance [covered by] the movement, as is explained in the *Physics*. ¹² It is, therefore, evident that it is not impossible for an instant as the limit of a temporal interval to exist without being preceded by time. Indeed, this possibility has been previously demonstrated to be necessary. ¹³

Furthermore, if we were to assume that time is a measure of motion by virtue of the instants that divide a particular motion into a before and after only and not because of the instants that are the limits ^f of the movement, one of the following two consequences would result. (1) Either we would say that the time which measures the motion is that which is between these ^g instants that divide the movement, and this results when it measures the motion between these instants; (2) or we would say that the time which measures the motion is the *number* of these instants ^h.

Now if we assumed that time is the number of instants, then time would not be a measure of the motion but of that which divides it, i.e., the instant; and it would also not be continuous, since an instant is not continuous with another instant. But this is absurd. ¹⁴ Moreover, it would also follow from this assumption that the time of different ¹ motions

¹¹Wolfson, *Crescas' Critique of Aristotle*, 652-53.

¹²Aristotle, *Physics*, IV: 11, especially 219a 15-219b 2, 219b 15-20, 220a 5-13; *Physics*, IV: 13.

¹³Gersonides seems to be referring to his proofs for the finitude of past time.

¹⁴This hypothesis is to be rejected because it makes the discrete aspect of time paramount,

whereas motion and time are continuous (Aristotle, *Physics*, VI: 1-4).

-361-

which are divided by the same number of instants would be equal. For example, the time of a movement that takes three hours would be equal in time to a movement that requires three years, if each of these two movements is divided only by the two instants [that break up each of the intervals into three parts]. It would also follow that the time of a given movement would be greater for one man than for another, if one of them^j divided it into more instants than the other. But this is obviously false.

On the other hand, if we were to say that the time which measures motion is that which is between the instants that divide^k the before from the after in this movement, it would follow that it would not measure that^l whole movement. Rather, it would measure only what is *between* the first part of the before and the last part of the after in the motion; but this is absurd, since it is clear that time is the measure of the *whole* motion as it proceeds in a forward direction.¹⁵ Furthermore, it would follow that different motions in time would be equal if they have been divided by instants [such that] what is between the instants is equal. For example, a movement that takes place throughout an interval of 1,000 years would be equal to a motion that takes one day, if each of these movements is divided by two instants such that in each case the interval between them is one hour.¹⁶ Furthermore, it would follow from this [hypothesis] that a motion which is divided by one instant only would take *no time*, since in this case there are not two instants dividing the earlier from the later in this movement; hence there would in this case be no time at all.¹⁷ Now

¹⁵The following diagram may be helpful:



This hypothesis says that time is that which is between the instants that divide the motion into before and after. Accordingly, time would be that which is in between i_1 and i_2 :t. There would be no time, then, between A- i_1 or between i_2 -B.

¹⁶As in the previous case, it is claimed that time is that which is between the instants dividing the motion into before and after. Here, however, we have two motions with different durations. Yet, it follows from this hypothesis that there would really be no difference between them, if the number of instants dividing the motions is the same in both. Consider this diagram:



If AB is divided by the two instants a and b such that the interval between a and b is equal to the interval resulting from the division of CD by c and d, then, since on this hypothesis time is this interval, the times of both AB and CD are equal.

¹⁷Remember that on this hypothesis time is that which is between the instants dividing the before from the after in motion. But if there is only *one* instant dividing the motion, there is literally nothing of time in this motion! This motion would be instantaneous (Touati, *La Pensée*, 236).

-362-

since all this is absurd, it is evident that time is a measure of motion *as a whole* by virtue of the instants that limit the movement, and not only by virtue of the instants that divide the before from the after.

Indeed, Aristotle's argument that the instant is essentially that which divides the before and after -- since the instant exists only potentially and the point when it exists in potentiality is of this nature^m -- is not valid. The nature of the potentiality inherent in the limit that divides into a before and an after differs from the potentiality in the existence of the instant. The potentiality that necessitates the limit's dividing the before from the after stems from the fact that the limit [here] is simultaneously a beginning and an end because of the continuity of that which it divides. The potentiality in the instant derives from the fact that the instant does not exist in time, as do things that exist in actuality. This feature follows from the nature of time itself, as we have seen, since it is impossible for time to exist in actuality such that a particular part of it exists and stands still; all the more so in the case of the instant.¹⁸ Now it is clear that the potentiality of the instant does not imply that it is a beginning and an end simultaneously. What is implied by this potentiality is that it is not a beginning in actuality, since that of which it is the beginning is not in existence [i.e., the rest of the temporal interval]. Nevertheless, it is possible for an instant to be potentially a beginning without also being an end, as is evident.

It is, therefore, clear from this latter consideration that it is not impossible for time to have been created absolutely, [i.e., at a first instant]. All the more so is it obvious from this that it is not impossible in this respect for time to pass away completely; for it is possible for an instant to be a *terminus ad quem* in actuality. This cannot be the case, however, for the instant that is a beginning; for past time has some actuality, and hence exists in some sense with the absolute last instant. But this is not the case with the absolute first instant. In a similar manner Aristotle has shown that whereas the end of a movement exists, the beginning of it does not.¹⁹

Someone might object that the potentiality in the beginning of a line divides the before from the after, and hence the same is necessarily true for an instant, since the latter can be a beginning only in potentiality. We reply that this objection is false. The meaning ofⁿ these potentialities is equivocal: there is potentiality [in the instant] in time because that of which [the instant] is the beginning does not [yet] exist with it; [there is potentiality] in the line because this [very same] point is both the beginning

¹⁸Aristotle, *Physics*, IV: 10, especially 217b 30-218a 8; Gersonides, *The Wars of the Lord*, Bk. 6, pt. 1, chap. 10.

¹⁹Aristotle, *Physics*, 236a 10-15.

and the end of things that are continuous. The defect of this argument should now be apparent. For [if it were valid], then it could be shown^o that linear motion and all movements from one thing to another would be infinite, since there would be no beginning except potentially. But this is obviously false.²⁰

An [additional] objection might be raised. Since time is a consequence of continuous motion and since the latter is necessarily circular, it would follow that the magnitude [i.e., length] transversed by this motion should also be circular. And, since it is evident that the instant is generated from the points that can be conceived [or drawn] on the magnitude [or length] transversed by this movement, the nature of the instant should be identical with that of the point on a circular line, because it derives its existence from the latter. Now, since the point on a circular line is always^p both a beginning and an end, so too is the instant always a beginning and an end simultaneously.

This argument is invalid. The fact that a point on a circular magnitude [is both a beginning and an end] follows solely from its being on a circular magnitude. But time is not circular; for the time that has gone by does not return when the motion returns on a circular magnitude. Thus, whatever is true solely because of the circular magnitude as such does not hold [in the case of time]. The defect of this argument can be easily seen; for it would follow from it that millstones, which have circular motion, would move for infinite time. But this is obviously absurd. ²¹And thus we have dissolved Aristotle's objection [from the nature of the instant].

²⁰Gersonides seems to be criticizing Aristotle's discussion of motion in *Physics*, VI: 5-6.

According to this criticism, the latter discussion is inconsistent with the finitude of rectilinear motion, which Aristotle insists on elsewhere (*Physics*, VIII: 8-9).

²¹Someone might think that because the heavenly bodies move on a circular path where every point is both a beginning and an end, these bodies can move forever without cessation. Gersonides replies that a circular path as such does not imply anything about the duration of the motion along this path. Not only moving millstones, but also balls in a roulette wheel eventually come to a stop (Abraham Shalom, *Neve Shalom*, I:11. P. Duhem, *Le*

CHAPTER XXII

THE third argument brought forth by Aristotle is based upon the nature of generation. The basis of it is as follows: since locomotion is the primary type of motion, ¹and locomotion necessarily terminates in a first self-moved object, ²it follows that if the heavenly bodies were generated, there would have to be a body moving in place to which the process of generation is traceable. The same holds if this mover is itself generated. But it is impossible to extend this series infinitely, since it is impossible for there to be an infinite number of bodies. Hence, there must be an ungenerated, self-moving body, in which case it is necessary that the universe be eternal. ³

We say that it is not too difficult to refute this argument. This argument is valid for cases of particular generation in so far as they are particular generations; however, if it is claimed that the universe in its entirety is generated, it doesn't follow that there must be a part of it to which its generation is traceable, as we have explained in Chapter Four of this book. Furthermore, we have already demonstrated that locomotion is not the primary kind of motion: rather the primary motion is generation. ⁴Finally, we have demonstrated that the generation of the universe is not a natural generation but one that is to be attributed to choice and volition, and therefore cannot be compared to natural generation; for things whose principles differ can themselves be different. ⁵

In this way Aristotle's objection can be removed.

¹Aristotle, *Physics*, VII: 2, 243a 10.

²Aristotle, *Physics*, VII: 1. Wolfson, *Crescas' Critique of Aristotle*, 551-55.

³Aristotle, *Physics*, VIII: 6, 260a 1-2. Averroes, *Tahafut al-Tahafut*, Fourth Discussion, pp. 158-59.

⁴Gersonides, *The Wars of the Lord*, Bk. 6, pt. 1, chap. 8.

⁵Aristotle, *Metaphysics*, III: 4.

CHAPTER XXIII

ARISTOTLE'S fourth argument is based upon the nature of generated things, in which the potentiality [for generation] temporally ^a precedes the actualization. ¹ This is so because potentiality and actuality are contradictions, and hence cannot be simultaneously present in the same subject in the same respect. Aristotle's argument then proceeds as follows.

If the world had been generated, it would have existed in potentiality prior to its actual existence; for this is the nature of all generated things. Now if this is the case, time would have existed before the generation of the universe. But if time existed then so did motion, and if motion existed so did a moving body. Now if there was a moving body it was either naturally in motion or by compulsion; if the latter there was also natural motion, since compulsory motion is predicated with reference to natural ^b [motion]. ² But it is impossible that there be natural motion which is not [one of] the natural motions that are presently found [in this universe]. Accordingly, [on this hypothesis] the world would exist prior to its generation -- which is false. This falsehood necessarily follows from the dubious assumption that the world is generated. And since the result of this assumption is false, so is the initial hypothesis. Hence, the universe must be ungenerated. In this way the eternity of the world can be proven, even if the argument is not given in this form by either Aristotle or his interpreters.

Now the principle employed in this argument, i.e., it is necessary that a generated object exist in potentiality before its actual existence in time, is such that it necessarily implies that time exists ^c before its creation either because of its antecedent potentiality or because of the necessity of the eternity of time. [In either case,] therefore, time precedes any generated object. However, if Aristotle advances this [principle] because of the necessity of the eternity of time, this ^d is a *petitio principii*. In short, it is evident that this principle is true for the generation of particular objects qua particulars, since time does precede this type of generation. But in the case of generation of the whole universe this principle does

¹Aristotle, *Physics*, VIII: 1, 251a 18. Averroes, *Tahāfut al Tahāfut, First Discussion*, pp. 39-40.

²Since violent motion, or constraint, is a departure from natural motion, the latter is primary, and is implied by the former (Aristotle, *Physics*, V: 6, 231a, 5-10).

not hold, since time is generated along with creation of the world. However, whether or not this principle is true by virtue of the pre-existence of the potentiality to its actuality requires investigation.

We say that there are two kinds of potentiality: (1) absolute potentiality, where that which is changed is in the *terminus a quo* of motion; or (2) non-absolute potentiality, where the changing object [is generated] in the transition between the *terminus a quo* and the *terminus ad quem* of the movement. Now, since the potentiality that obtains between the two termini of motion co-exists with the movement, its existence implies the existence of time; for time is found with any kind of motion. But the potentiality that is in the *terminus a quo* [of motion] does not imply time, since here there is no motion. Thus, when we postulate a first change that is generated [i.e., a primary instance of generation] we do not imply a preceding time. ³ In this way we obviated Aristotle's objection.

Someone might object that since the potentiality and actuality [for some condition] cannot simultaneously be present [in one subject] in the same respect, the potentiality for this change must precede the actualization of this change. And if the potentiality precedes the actualization, it precedes it temporally, since before and after are parts of time. We say that the term "before" is

used here metaphorically ^e, since in this context there is no time. Accordingly, in using the term ^f "before" we do not imply here temporal priority, even though we cannot imagine such a thing. [But,] as we have seen, not everything that is true can be imagined. ⁴

³Thus, the creation of the universe is a case of the first type of potentiality.

⁴Touati, *La Pensée*, [216](#) - [18](#).

-367-

CHAPTER XXIV

ARISTOTLE's fifth argument is based upon the nature of motion. He maintains that it is impossible for motion to be generated absolutely or to pass-away [absolutely]; hence, it follows that there must be a body that is eternally in motion, since contiguous motions are neither continuous nor eternal. His proof is as follows. ¹

If we assume that there is a first generated motion, then that which is moved in it is either generated or not generated. If it is generated, then the assumed first motion is not really the first, since the motion involved in generation is prior to it. But if the latter motion is then alleged to be first, it will necessarily follow that it is really not the first, both with respect to the agent of motion and that which is affected [i.e., moved]. That this is necessarily the case for the agent Aristotle argues as follows. When the agent is at one time active and at another inactive, there must be ^a some change that stimulated the action at a particular moment. Hence, prior to the "first" change [i.e., the first motion] there would be [an earlier] change. And if we were to say that the latter change ^b is the prior one, by virtue of the same argument it would follow that another change would have preceded it, and so *ad infinitum*. It is clear that this argument concerning the agent -- that prior to any change that is alleged to be first there is another preceding change -- is valid whether or not that which is moved first is generated.

With respect to that which is affected [i.e., moved, Aristotle argues] that every case of generation is preceded by a change; hence, the alleged first motion is not really first. And if the preceding change is alleged to be the first change, it would follow that prior to the generation of the change there was the generation of the possibility of change, since the potentiality is [temporally] prior to the actualization of all generated things, and the generation of the possibility for change is either itself a change or consequent upon a change. Now if the first change is thought to be the change that generates the possibility for change, by the same argument [as above] it would really not be the first change, since the generation of the possibility for this latter change would be prior to the generation of this [latter change], and so *ad infinitum*. ²

¹Aristotle, *Physics*, VII: 1. Thomas Aquinas, *SCG II*32-37. Averroes, *Tahāfut al Tahāfut*, *First Discussion*. Maimonides, *Guide*, II, ch. 14, first, fifth and sixth methods.

²No matter which event e is taken to be the first change, it will always be preceded by another event which generates the possibility of e, and so *ad infinitum*.

-368-

Now suppose that which is moved in the generated motion is [itself] not generated and that it is the nature of its mover to initiate motion and to undergo motion. Why ^c is this mover one time in motion and at another not in motion? There must be a change in either that which does the moving or in that which undergoes the motion or in both. Accordingly, the motion that was

thought to be the first is not really the first. If it is said that the latter change is the first, it would follow [as we have seen previously] that prior to it there would be a change, and so *ad infinitum*. And so it is clear that there cannot be a first generated motion whether or not the first moving object is generated. ³

In addition to this argument Aristotle provides two other proofs that there is no first motion. The first is based upon the transition from potentiality to actuality; the second concerns the relation that is generated in the first mover. With respect to the former proof Aristotle believes that when a potential mover becomes an actual mover, there must be a change present, since the transition from potentiality to actuality is a change, and that this consequence obtains whether or not the first moving object is assumed to be generated. ⁴ With respect to the second argument, he claims that if the [first] motion were generated, a [new] relation would occur to the first mover, i.e., a relation between the mover and that which is moved. Now the generation of this relation cannot come about except by a change, and so the alleged first change is not really first. Hence, there cannot be a first generated motion. This consequence is true whether or not the first moving object is generated.

In a similar manner it can be shown that there cannot be a final motion. For if there were a final motion, either of two consequences pertaining to the moving object ensues: either that which moves loses the potentiality for motion at the same ^d time as it ceases to move; or it doesn't cease from being able to move [even after it stops moving]. Now if the possibility of motion in the moving body does not terminate with the termination of movement, then after the last motion there would exist the possibility of motion. [However], if we were to assume that this potentiality was actualized, an *absurdity* would result, i.e., after the last movement there would still be motion. But from a possibly false proposition an *absurdity* does not result. Thus, if a last movement were admitted, then it must be the case that the possibility for motion would end along with the cessation of the motion itself. But if we say that the moving object ceases in both aspects, there will yet be two changes; and the change involving the loss of the possibility for motion would necessarily

³Aristotle, *Physics*, VIII: 1, especially [251 a 10](#) - [251 b 9](#).

⁴Aristotle, *Physics*, III: 1- [3](#).

take place after the loss of the motion, since motion and the possibility for motion are two contrary states and cannot exist in the same subject and in the same respect unless at different times. Hence, the possibility for motion must exist after the loss of motion. But it will cease only after it has existed, and it will vanish only after the motion has ceased; hence, after the last movement there would still exist the possibility of motion, and this has just been shown to be absurd. Moreover, that which is the cause of the cessation of motion must itself vanish after the loss of motion; otherwise it would have the possibility for ending motion. But when this possibility is assumed to be realized, the absurdity of a motion after the last motion results. When, therefore, Aristotle demonstrated the absurdities inherent in the hypotheses of either a first or of a last motion, he concluded from this that motion must be eternal and that there must be an eternal body that moves eternally.

We claim that it is evident from the slightest bit of philosophical reflection, along with what we have already established, that it is possible to posit an absolute first motion in so far as the first moving body is assumed to be generated in the manner which has been proved [i.e., voluntary generation]. Now ^e Aristotle's objection to this claim -- that when the agent acts at one time but

not at another there must be an internal change whereby it is stimulated to perform this act now and not earlier -- has been solved in Chapter Eighteen of this Book. ⁵In addition, we claim that his inference from the emergence from potentiality to actuality in the mover that there is no first change is invalid. It is true that all change involves an emergence from potentiality to actuality, as Aristotle has shown in his definition of change in the *Physics*. ⁶But it does not follow from this that every emergence from potentiality to actuality is a change. For change is the emergence from potentiality to actuality which [occurs] in the object to be affected; it is not the emergence from potentiality to actuality which is in the agent to perform its activity. This is selfevident from [Aristotle's] definition [of motion]; for he says that motion is the actualization of that which is movable in so far as it is movable. ⁷In general, the change is in that which is undergoing the motion, not in the mover. Were this not the case, the agent would be moved by the very work [that it imparts]. ⁸

⁵*Supra*, chap. 18, ninth objection and reply.

⁶Aristotle, *Physics*, III: 1- [3](#).

⁷Aristotle, *Physics*, III: 2, [202 7](#) - [8](#).

⁸The teacher doesn't learn arithmetic in teaching the student how to count. See Philoponus' analysis of this problem in *De aeternitate mundum: Contra Proclum*, III: 4, p. 48, lines 23-49; III: 6, p. 53, lines 20-24. S. Feldman, "Philoponus on the Metaphysics of Creation", *A Straight Path: Essays in Honor of Arthur Hyman*, ed., R. Link-Salinger (Washington, DC, 1988), p.79.

-370-

Moreover, if the emergence from potentiality to actuality in the agent were a change, we would have to say that every mover undergoes change in so far as it is a mover. For, according to the general principles [of mechanics], motion is one in subject although having two aspects. For when we attribute motion to the mover we call it "motivity" [*hana'ah*], whereas when we attribute it to the body that is set in motion we call it "movability" [*hitno'a'ut*]. It is clear, then, that when there is potential movability there is also potential motivity, and that when there is actual movability there is actual motivity. Thus, it would follow that the definition of "motivity" would be "the actualization of potential motivity in so far as it is potential"; and analogously, the definition of "movability" would be "the actualization of potential movability in so far as it is potential." Now when the necessity for the existence of a potentiality for motivity is so understood, it should be evident that if the emergence from potentiality to actuality in the motivity were itself a change, every mover would itself change in so far as it is a mover. But this consequence has been shown in the sciences to be absurd. Moreover, it would also follow from this hypothesis that there would be two simultaneous motions, one in the mover and the other in the moving body. But this is the opposite of what Aristotle has already demonstrated without any doubt concerning the nature of motion; for he proves in the *Physics* that there is only one motion, and that motion is in the moving body. ⁹

Finally, it is clear from movers that we ourselves observe that they move at one time and not at another without undergoing change. For example, an object of desire, even if it is corporeal, moves [something else] when the latter chooses it; it is itself not changed thereby. The change accrues to that which is moved [by the desire]. ¹⁰Accordingly, it is not impossible in this sense that motion be generated.

[Let us now consider] Aristotle's argument with respect to that which is affected [by motion]. [According to this argument], if the latter is said to be generated, then the [postulated first] motion would not be generated, since every case of generation would be preceded by a change;

and if that change were itself thought to be "the first", then prior to it there would have to exist the generation of the possibility for change, and so

¹⁰Aristotle, *On The Soul*, III: [10](#), where the desired object is said to be unmoved even though it is the source of movement.

⁹Gersonides' argument constitutes an internal criticism of Aristotle, showing that Aristotle's own theory of motion vitiates the objection that has been raised against the possibility of a first motion. This objection, Gersonides suggests, leads to an infinite regress, thus undermining Aristotle's principle of an unmoved mover. In addition to Aristotle's discussions in *Physics*, III: 1- [3](#) and V: 1-2, Wolfson's comments in *Crescas' Critique of Aristotle*, [523](#) - [30](#), ought to be consulted.

-371-

ad infinitum. This argument can be easily handled in light of what has been proved with respect to the generation in question, [i.e., the generation of a whole universe]. We claim that the possibility involved in change can be understood in three ways: (1) natural possibility; (2) possibility with respect to choice and will; and (3) the possibility that involves nature and choice together.

Natural possibility uniquely differs from the other kinds of possibilities in that its relation to each moment [of time] is not uniform; rather, its relation to the instant which is closer to its moment of actualization is stronger. For example, the possibility in copper for becoming viridis is such that its relation to the moment nearest the moment of generation [of viridis] is stronger, since at that point the generating agent is closer to it. The relation between the agent and different individual recipients is not uniform in [this kind of possibility]. Rather, the relation to the recipient that is closer to [the agent] is stronger; for this recipient is more prepared to receive its activity. Similarly, the relation between one recipient and different agents is not uniform in [this kind of possibility]. Rather, the relation to the agent that is closest to [the recipient] is stronger. This is obvious in the domain of natural possibilities. For example, the possibility of the generation of [the element] earth [into] fire is greater at a time of heat than at a time of cold. ¹¹ Similarly, when fire is present in a particular place, the possibility of receptivity to it inherent in the parts of the earth is not uniform; rather the parts that are closer to it are more prepared to receive its activity. Or, when the earth is in one place and surrounding it are many fires, the possibility for being affected by these fires is not uniform. Rather, the possibility of being affected by the closest fire is greater. Thus, it is proper to know that the receptivity is uniform where there are different recipients within a given species that are equidistant from a natural agent when they are of the same magnitude. Similarly, the natural receptivity in one recipient for [the activity] of agents that are many in number but the same in species is uniform whenever these agents are of the same magnitude. ¹²

Possibility in choice alone, however, differs from the other kinds of possibility in that it is uniformly related to all moments of time, since its actualization is not the consequence of a change at all; rather it is consequent upon the will of an agent. Hence, there is no one moment that is

¹¹Aristotle, *On Generation and Corruption*, II: [4](#).

¹²Case 1: if ten wax candles are placed in a circle around a fire all of them will melt at the same rate if they are of the same magnitude.

Case 2: if ten magnets of equal size are equidistant from an iron nail, i.e., they are placed in a circle around the nail, the nail will not be attracted by any of them. (Touati, *La Pensée*, [239-42](#)).

-372-

more propitious than another for the actualization^h of a particular possibility. Moreover, the relation of this kind of possibility to recipients of change within a given species is uniform, i.e., there is no more reason why a recipient nearer to [the agent] than another recipient should be actualized. For example, if Reuben the goldsmith wants to make golden rings for no particular purpose (if this is at all possible), and if there are many pieces of gold in his vicinity, the piece closest to him is no more fitting to be made into a ring than any other piece. For this action is consequent upon the will of the agent, and whichever piece he selects can be made into the ring; e.g., if he wishes, he could select the piece farthest from him, something that is impossible in the case of natural agents. Similarly, the relationship is uniform between one recipient of change and many agents of the same kind. For example, the possibility in this particular piece of gold to be a ring doesn't differ with each goldsmith, even with the one closest to it. This is so because in cases of choice the proximity between the agent and the recipient is not decisive; indeed, an agent can be near a recipient for a long time and yet not act on it at all. Hence, in the case of recipients that are equidistant from a voluntary agent it does not follow that they are equally affected at the same time by this agent. Nor does it follow in the case of voluntary agents that are equally distant from a recipient that they equally and simultaneously affect this subject.

Now the possibility that is both natural and voluntary, such as the possibility in Reuben for building a house when it is cold for the purpose of protection, is like an intermediate case between the two preceding types of possibility. Its relationship to time is not uniform, since nature defines a particular moment as the most propitious for the actualization of this possibility. However, its relationship to the various recipients of change in a given species is uniform, even though some are closer [to the agent] than others; i.e., the factⁱ that one recipient is closer to the agent than another does not necessitate that it be more likely to be affected by the agent, since it is a matter of the latter's choice. For example, when Reuben wants to build the house, the possibility in the stones [to be used as materials] nearest him is no greater, since it is possible that he use stones that are far from him to build the house, *if he prefers* them more. And for the same reason the relationship is uniform between the many individually different voluntary agents [of one species] and the one recipient. Thus in the case of many recipients that are equidistant from a voluntary agent, it does not follow that they will be equally and simultaneously affected by this agent. Nor does it follow that if there are many voluntary agents equidistant from a recipient that they will equally and simultaneously act upon it; for their activity is consequent upon their volition.

-373-

Now when these various kinds of possibilities are fully understood, it will be seen that it does not follow that every change must be preceded by another change, i.e., the change from whose occurrence the possibility for the former change is generated. This requirement would indeed seem to obtain in natural changes, since natural possibilities are necessarily determinate and there is a particular time that is more propitious for its occurrence [than another time]. It is evident that the fact that there is an optimal time for the realization of the possibility is necessarily a consequent of a change, and because of this its relation to this particular moment is stronger. However, with respect to the kind of change that results from volition, as in the creation of the universe (as we have previously demonstrated), it does not follow that there exists prior to

it a change in which the possibility for the [former] change is generated; for] the actualization of this change is not consequent upon change at all. This kind of possibility is, therefore, uniformly related to all instants; and whatever is of this sort could exist for infinite time, if time could be infinite. This is quite evident, since there is no particular moment that is more fitting than another for the realization of this possibility. Hence, in volition the possibility always exists before the actual changes occurs, and there is no necessity to assume a [prior] change in which there is generated the possibility of this change. For example, if we assume that there is a piece of gold near Reuben the goldsmith and that he can make a ring from it merely from choice, and not for any personal benefit, then there is no necessity that this possibility be realized, even if the goldsmith and the gold are assumed to be eternal. Rather, in each moment its actualization or non-actualization is equally [possible]. For the kind of possibility that is necessarily determined by time is so because it is not uniformly related to all the moments of time in which it is present. This is quite evident. Hence, it follows by contraposition that a possibility that is uniformly related to all the moments of time in which it is present is not determined by time. Accordingly, it is possible that the possibility of this voluntary generation could have existed eternally until its generation; for this is not impossible in what results from volition, as we have previously seen. You should know that when we use here the word "time", we use this term loosely, since on the hypotheses of creation there is no time before the creation of the universe. ¹³

¹³One of the stock arguments against creation at a definite instant was, why should God have created the world this moment and not another? Or, why did He create it at all? (Maimonides, *Guide, II: 14*, fifth and sixth methods. R. Sorabji, *Time, Creation, and the Continuum*, chap. 15). To create a world after none existed previously would seem to imply a change in the creator. To meet this objection Gersonides revises Aristotle's theory of change in order to give more prominence to changes resulting from choice. Gersonides claims that changes emanating from choice do not need to be preceded by an antecedent change whereby the choice is generated. The agent can simply choose to act or to make an object. In general, where the relation between the agent and the act is utterly indifferent, the action is not determined or defined by time [nigdar ha-zeman]. Hence, there is no prior change by or from which the creative act came about. The agent may simply act *ad libitum*. In the case of creation, God did not have to create the world. So, like Reuben the goldsmith who made a ring just for the pleasure of making it, He created it *because and as He pleased*, without any definite reason. It was literally a *gratuitous* act. Thus, no external agent or cause was needed to bring Him from a state of potential creativity to a state of actual creativity, as Aristotle's theory requires.

Moreover, we claim it does not follow that that which is to change must exist temporally prior to the existence of the change itself, as Aristotle claims. It is possible that the change and that which is to be changed are simultaneously generated. It would not be necessary, for example, that the heavens exist for some period of time before they actually move. Indeed, we find this occurring in natural phenomena. For example, when fire is generated from earth, the generation of fire, whose natural motion is upwards, and the generation of this upward motion are simultaneous, so long as there is no obstacle. Nor^k should it be objected that the possibility for upward motion is inherent in the earth from which fire is generated. For it is not the nature of earth to have upward motion, unless, by God, it would be alleged that the possibility for upward motion is found in earth by virtue of the possibility which it has for the emergence of fire from it. In truth^l, [however], this possibility [for upward motion] is in fire and not in earth. For if it were assumed that the possibility [for upward motion] is in earth by virtue of the fact that it possesses the possibility for the emergence of fire from it, as Averroes claims in his reply to Philoponus'

objections in this context, then a natural possibility that is infinite in time and indeterminate would exist. For example, the potentiality that is present in the sperm from which Reuben is to be generated would, on this assumption, already be present in the food from which the sperm was generated by virtue of the possibility that sperm can be generated from food. Analogously^m, it would followⁿ that this possibility [i.e., the generation of sperm] will be present in that from which food is generated, and so on *ad infinitum*. But this is absurd; all the more so is it absurd to the believer in eternity.¹⁴

Moreover, it is clear from Aristotle's own proof for his principle that the possibility of change precedes the change itself -- since in all cases of generation we find that the potentiality precedes the actualization -- that he is referring to the potentiality of that which has [the natural

¹⁴Aristotle himself rejects infinite causal chains of essential causes (*Metaphysics, II: 2*). The generation of the seed from some kind of nutriment would be a case of essential causation (Maimonides, *Guide, I: 69* and *73*, 11th premise).

-375-

capacity] for motion of a particular kind. Therefore he proved this from the definition of motion, i.e., motion is the actualization of the movable qua movable.¹⁵ Thus, there is no motion unless there is first something capable of having this [kind of] motion. It^o is clear that he is in fact claiming here that prior to the occurrence of motion there exists [a body] that has the natural capacity for [this particular kind of] motion, as in the case with the moving object referred to in the definition of motion. [He is not referring to] something that does not naturally have this capacity, as is the case with the natural potentiality for upward motion that Averroes alleges to be inherent in the earth. For this potentiality would, however, be in the earth in such a way that it could not naturally have this motion.¹⁶ This is not the [kind of] potentiality that Aristotle claims to exist prior to actualization in generated things.

Also, since it is said in the description of the light that it has the nature to move in an upward direction, whereas in the definition of the heavy [it is said that] it has the nature to move downwards, it is evident that we cannot say that it is the nature of earth to move upwards [merely] because of the possibility it has for the emergence of fire from it. For it is impossible for earth to be able to move upwards and downwards simultaneously. Hence, it is clear that we cannot assign the possibility for upward motion, which exists in fire immediately upon its generation, to the earth from which the fire emerges. Accordingly, that which is capable of moving in this particular manner and the motion itself exist simultaneously, though there is a natural priority of the movable object to the motion, not a temporal priority.¹⁷ Thus, it is evident that it does not follow from this argument that the postulated first change is not really the first. And so we maintain that the generation of the universe is *the first change*, but it is not a motion, as we have previously explained. *The first motion*, however, is the motion of the heavenly bodies; and we have just proven that it is not necessary that the heavenly bodies precede this [first] motion in time.¹⁸

We say further that Aristotle's argument that a first change is impossible because of the relation generated [by this change] is not compelling. A new relation can occur when only one of the related entities changes, without the other changing. For example, when something changes so

¹⁵Aristotle, *Physics, III: 3*.

¹⁶The phrasing in this sentence is a bit awkward, especially the phrase



But Gersonides' point is, I believe, clear. On Averroes' theory we would have a capacity for upward motion residing in something that has a natural capacity for downward motion. This is, for Gersonides, an impossible situation.

¹⁷Aristotle, *Metaphysics*, V: [11](#).

¹⁸Compare Thomas Aquinas, *Summa Contra Gentiles*, Book II, chaps. 17-19.

-376-

that it resembles another thing, a relation is generated between them, i.e., the one is similar to the other; but only one of the related things has changed. Accordingly, we say that the change that is responsible for this relation is the postulated first change, i.e., generation of the universe, whether its creation be interpreted as occurring in time or in no time. If in no time, it is obvious from its very nature that the relation and the change are simultaneously generated. If, however, creation were in time, this could also be proven as follows. There are relations which are generated at the end of the change, as in the case of the resemblance previously adduced as an example and cases similar to it. In other cases the relation is generated in the beginning of the change. This is indeed the case when the relation results [essentially] from the change [itself], as in the relation between that which is the cause of the change and that which is changed. It is therefore evident that the relation generated by this first change between the cause of change and that which changes is itself generated with the generation of this change. Accordingly, it is not impossible that the generation of the universe be ¹⁹the first change.

In this way it can be shown that Aristotle's argument showing that there cannot be a last movement is also invalid. It is open to someone to say that the moving object ceases moving and ceases to have the capacity for that motion at the same time. For example, when [an organism] that can take food dies, its power to take nourishment ceases together with the movement of nourishment. Analogously ^p, in this manner it would be possible for the first movable body, if it is assumed to be corruptible, to cease from its circular motion and to cease having the capacity for this motion simultaneously ^q. Hence, Aristotle's principle that the change, which is the passing-away of the possibility of a regeneration of motion, must occur after the cessation of motion is false. We maintain that the movement and the possibility for movement exist simultaneously as long as the moving body moves, although they do so in different senses. Motion, as has been explained, is composed of potentiality and actuality. But the actuality in motion results from that which has been actualized from the motion; whereas the possibility [i.e., potentiality] in

¹⁹All the manuscripts consulted and the printed editions read:



As it stands, this sentence states that it is possible for the generation of the world not to be the first change. But this contradicts what Gersonides has been arguing for throughout this chapter; indeed in the previous paragraph he explicitly says that the generation of the universe is the first change! Accordingly, I emend the sentence as follows:



(Professor Alfred Ivry called this point to my attention).

motion consists in that which remains to be completed by the movement. ²⁰ It is therefore evident that the motion and the possibility for motion exist simultaneously as long as this movement persists. And since they exist simultaneously, it is not impossible that they can also cease simultaneously. This is evident from [Aristotle's rule] that whatever passes-away passes-away after having existed.

The inadequacy of Aristotle's proof is quite apparent. For it yields the consequence that a particular man, e.g., Reuben, cannot die, which is obviously absurd. And that which yields an absurd consequence is equally absurd; hence, the principle from which Aristotle^r derives his conclusion is itself absurd. The demonstration from his principle that Reuben cannot die is evident. If it were possible for him to die, he would have as a living creature a last sensation. It is evident [in Aristotle's theory] that his ceasing to have sensation is different from his ceasing to have the capacity for sensation. His capacity for having sensation will necessarily disappear *after* the cessation of sensation. Hence, after the occurrence of the postulated last sensation there still remains the possibility for sensation, which, if it is assumed to exist in actuality, yields an absurdity: after the last sensation this living creature still has sensation; and thus ^s the sensation that was alleged to be *last* is not really the last. But a premise that is possibly false does not yield a logical absurdity. If so, this ^t absurdity results from the premise that Reuben^u can die. Accordingly, it would follow that Reuben cannot die. But this is clearly absurd. ²¹

Perhaps someone might think that this absurdity does not follow from Aristotle's argument. He would claim that Aristotle did not only infer the cessation of the motion that the body was undergoing but also the cessation of any other motion; and Aristotle would say that the possibility [for motion] ceases after the cessation of motion. Accordingly, it might be thought that the absurdity adduced above would not follow from Aristotle's proof. For Reuben, even if he were to die, would not cease [to be capable] of moving with a motion other than the motions which are typical of animate creatures. ²²

Nevertheless, a close examination of Aristotle's wording in this proof reveals that the possibility for motion to which Aristotle was referring here is the motion ^v that the body [typically] undergoes, not another [kind of] motion. For if this possibility were related to another kind of motion, Aristotle's claim that motion and the possibility for motions are

²⁰ Aristotle, *Physics*, III: 1 and 3. Gersonides, *The Wars of the Lord*, Bk. 6, pt. 1, chap. 10.

²¹ Thus, the principle that the cessation of sensation and the cessation of the possibility for sensation are different is false, since it yields this absurdity.

²² For example, his body could be moved by the grave-diggers.

contraries would not be true; since there would be no contrariety between them unless the possibility is related to that [particular kind] of motion. This indeed seems to be the case, since potentiality and actuality are contradictories. For example, it is impossible for Reuben to be possibly [i.e., potentially] black and actually black simultaneously. However, if we relate the possibility to some other characteristic besides black, this would not be impossible. For example, he can actually be black but be simultaneously potentially white. All the more so can he have other features such as heat or cold or any other qualities besides black or contraries of black, [i.e., colors]; for these characteristics can be [severally] simultaneously actualized [along with his blackness]. Consequently, Aristotle clearly means by this possibility for motion a possibility

for that [specific kind of] motion which is undergone in the last movement. Accordingly, the absurdity that we have previously demonstrated to follow from Aristotle's principle is genuine.

Moreover, if we were to grant, for example, that after the last sensation the possibility for sensation still obtains, it would not follow that no final sensation will be present in this organism, [as Aristotle maintains]. For, in our assumption that this organism will die, we have not claimed that any [particular] alleged [last] sensation is necessarily the last sensation; rather, we have claimed that there must be *a* last sensation *simpliciter*. Thus ^w, it is evident that given any sensation of this animal such that the animal can still have sensation after it, it would be possible for this sensation to be or not to be last. If the possibility [for further sensation] is actualized, then that sensation is not the last. If [this possibility] is not actualized afterwards as long as the organism continues to live, then that sensation is indeed the last sensation. Since this possibility may or may not be actualized, this assumed sensation may or may not be the last. Therefore, it is evident that given any sensation alleged to be experienced by the organism it may or may not be the last. But it is necessary that there be *a* final sensation, since the organism [*ex hypothesi* will necessarily die.

Accordingly, nothing prevents us from saying that even if the world is destructible and we admit that the possibility for further motion necessarily exists after it ceases moving, as Aristotle maintains, there could still be a last motion, just as we postulated in the case of the last sensation. For, given any motion that it possesses, this motion ^x may or may not be the last. If this possibility for motion that still obtains is actualized, the postulated motion is not the last. If the possibility is not actualized, then that motion is indeed the last motion. In short, if we assert that the universe will necessarily be destroyed at *some* time, it does not follow that any particular motion will necessarily be the last, although it may be. Similarly, it is inevitable, for example, that Reuben die; but there is no

-379-

particular moment in which he must die. For, [although] he must die in some moment, he does not have to die at *this particular* moment. The same holds for the universe if it is assumed that it *must* be destroyed at some time. All the more so is it true if it is claimed that the universe *may* be destroyed at some time: it is not necessary that a particular motion be the last, though it is possible [that it be the last]. It is therefore evident that Aristotle's argument does not preclude a last motion.

Finally, concerning Aristotle's contention with respect to the cause of destruction, it is evident that matter is the cause of destruction if there is such cause of destruction, as we explained. ²³It is [also clear] that from Aristotle's proof, granting its validity [for the sake of argument], it does not follow that the universe cannot be destroyed; rather, it follows, as it would appear, that the destruction cannot be such that no generation can take place after it. Hence, Aristotle's inference [from this proof] that motion is eternal is not valid. It is also clear that we do not claim that it is possible for motion to stop at some time; rather, we have indubitably demonstrated this impossibility. In this ^y place, however, we have demonstrated the invalidity of Aristotle's proof for the impossibility of a last motion since it is not proper that we deceive ourselves and think ^z that Aristotle had succeeded in proving this impossibility by this argument. But we have demonstrated the invalidity of his argument. In general, to demonstrate a true statement by invalid arguments is to weaken the truth, not strengthen it. This is quite obvious.

²³Gersonides, *The Wars of the Lord*, Bk. 6, pt. 1, chap. 16.

CHAPTER XXV

ARISTOTLE'S sixth objection is from the nature of the first matter. He maintains that this matter is neither generated nor destroyed essentially. If it were generated, it would have to be generated from a subject; but if it had a subject from which it had been generated, it would itself be the subject, since whatever is in potentiality cannot be separated from that which is in potentiality. It would therefore follow that it would exist before it existed or that it would exist in actuality, each of these consequences being absurd. The same would be the case if the first matter were destroyed. Hence, since it is of the very nature of first matter not to exist deprived of some form, it is evident that the universe is eternal. ¹

We have already shown that this argument does not entail that the universe is eternal. We claim that the nature [to receive various forms] is generated in first matter when the forms of the elements are generated in it, as has been explained in Chapter Eighteen of this Book, where this difficulty is answered in full.

¹Gersonides' statement of Aristotle's argument follows *Physics, I: 9. 192a 27 ff*, but not exactly. The original argument is as follows:

"But as potentiality it [primary matter] does not cease to be in its own nature, but is necessarily outside of the sphere of becoming and ceasing to be. For if it came to be, something must have existed as a primary substratum from which it should come and which should persist in it; but this is its own special nature, so that it will be before coming to be. (For my definition of matter is just this -- the primary substratum of each thing, from which it comes to be without qualification, and which persists in the result)".

(Hardy & Gaye translation).

Gersonides' version of the argument inverts the order of some of the sentences and does not reproduce all of this passage. His summary does contain, however, the crux of Aristotle's argument. Prime matter is introduced to explain substantial change, or genesis; it is defined as that which is in potentiality all forms. If it were generated, it would be generated out of a subject, which would then be that which is potentially all forms. But the latter is precisely what prime matter was said to be *ab initio*.

CHAPTER XXVI

ARISTOTLE'S seventh objection is from the nature of the celestial bodies. The basis of his argument is as follows: Anything that is generated is generated from its contrary and passes-away into its contrary. Now it follows from this premise by contraposition that whatever cannot be generated from or cannot pass-away into its contrary is neither generated nor destroyed. The fifth body [i.e., the celestial body], however, cannot be generated from its contrary nor pass away into its contrary, since it has no contrary. Hence, the heavenly bodies are ungenerated and indestructible; hence, the universe *in toto* is eternal. ¹

It is clear from our preceding discussions that this objection can easily be met. What is true of the generation of particular objects, i.e., they are generated from contrary states, is not true of the

generation of the entire universe as we have already demonstrated. Moreover, the total generation [of the universe] also differs from cases of the generation of individuals in another respect: the latter are attributed to natural generation, whereas the former is attributed to volition. Now in voluntary generation we find the emergence of something from nothing, as in the case of the arts where a shape emerges from none before. For example, a ring is made from something that did not have the shape of a ring; for a shape^a does not have a contrary.²

Moreover, in natural generation we find that that which has a contrary is generated from this contrary, as in the case of mixtures. However, where there are no contraries generation takes place from nothing, as in the case of a [new] form. Hence, it is not impossible that the world be generated because it has no contrary. Indeed, we even find in most cases of natural generation that generation occurs not from a contrary; for most of the things generated are forms of some sort, even if some are [merely] the perfections^b of other forms. Now it is clear that forms have no contraries, except the elemental forms, as we have explained in our *Supercommentary on the Book of Animals*.

¹Aristotle, *On the Heavens*, I: 3.

²Aristotle, *Categories*, V: 3b 24. Gersonides distinguishes here between generation from contrary states and generation from privation to form. The former is typical of natural generation; the latter takes place in voluntary generation. The distinction is Aristotle's, but Gersonides uses it to argue against Aristotle (Aristotle, *Categories*, X; *Metaphysics*, X:4

-382-

Indeed, the generation of composite things is not essentially from a contrary at all, since the form that is generated in this generation has no contrary. But it happens that the form results from a qualitative change which happens to proceed from one contrary to another and so prepares the matter [for further changes]. Now the preparation of the matter requires the generation of a particular qua particular, since this kind of generation is the destruction of the entity from which the generated thing emerges. Hence, the matter must change in such a way that the first form will disappear and it will be prepared to receive the second form. But in the case where generation does not occur as the result of [a prior] corruption, which has been shown is the case with the heavenly bodies, it is not impossible that generation is only a receptivity [of form, not a change from one contrary to another], as is the case in some instances of natural generation, e.g., the acquired intellect. It has already been proven in Book I that the generation [of the acquired intellect] is^c merely the receptivity [for knowledge]. And similarly^d, it is possible that the generation of the heavenly bodies involved merely receptivity, in so far as it received the form of preserving [a definite] shape, and by virtue of this form it can receive the separate form, its mover. And so it is not impossible for the heavenly bodies to be generated in this sense. From this it can be demonstrated without any doubt, however, that it is impossible for the heavenly bodies to be destroyed, since destruction necessarily occurs to something [only] in the above-mentioned manner, as we have just explained.

-383-

CHAPTER XXVII

ARISTOTLE'S eighth objection is [based upon] the nature of that which is eternal and of that which is generable and corruptible. He maintains that whatever is generated is corruptible and that whatever is corruptible is generated. It follows from this, [he argues], that whatever is incorruptible is ungenerated. Thus, since it has been demonstrated that the heavenly bodies must

be incorruptible, it follows that they are ungenerated. Therefore, he says, it is impossible for the ungenerated to be corruptible and the incorruptible to be generated. The basis of his argument is as follows. ¹

¹This chapter may very well be the most difficult chapter in the entire treatise; it is also one of the longer chapters. Touati describes it as "most arduous and arid...[yet having] considerable importance" (*La Pensée*, [293](#).) It is certainly abstract and even abstruse, but it is also acute and profound. Despite its length it has a single theme, the refutation of Aristotle's fundamental theorem: whatever is generated is corruptible and conversely (Aristotle, *On the Heavens*, I: [12](#)). Aristotle uses this theorem to disprove Plato's cosmological model of a universe with a beginning but no end, which is of course Gersonides' own model. For Aristotle there are only two cosmological alternatives, either: (1) the universe is eternal, which is Aristotle's view; or (2) it is generated and corruptible, which means that at some time it will be destroyed. *Tertium non datur*. Gersonides has the daunting task of defending a doctrine that to Aristotle is not just false but utterly wrong-headed.

Aristotle's general thesis can be conveniently summarized by the following syllogism:

1. Aristotle's theorem.
2. The heavenly bodies, at least, are not corruptible.
3. The heavenly bodies are not generated, i.e., heavenly bodies are neither generated nor corruptible; Hence, they are eternal.

To defend Plato's and his own theory of a generated, but incorruptible universe Gersonides will have to show that Aristotle's theorem is false. In Book I: 12 of *On the Heavens*, Aristotle gives the demonstration of this theorem (chapter 12). This present chapter of *The Wars of the Lord* is a detailed critique of Aristotle's arguments. Since it is a long and complex discussion, it will be useful at the outset to have a general picture of the course and structure of Gersonides' critique.

According to Gersonides' exposition of Aristotle's position there are at least a half dozen arguments that Aristotle advances in behalf of his theorem. Some of these arguments are, however, only variations of others. There are in fact two main arguments that Aristotle employs to prove his principle: one is metaphysical, the other logical. The metaphysical argument claims that the hypothesis of a generated but indestructible universe asserts the co-existence of two contradictory states, and hence is absurd. For, in so far as the world is *ex hypothesi* generated, it is non-existent throughout all of infinite past time; but in so far as it is *ex hypothesi* indestructible, it is existent throughout all of infinite future time. We have then two contradictory conditions that are each infinite, or at least indefinite; but such states are co-existent, or simultaneous, which is impossible. Aristotle adduces several subsidiary arguments in support of this main argument; they all attempt to show that the Platonic and Gersonidean cosmological model envisages a situation that is intrinsically incoherent: a universe that is *simultaneously existent and non-existent*. Here Aristotle assumes the principle that if a thing is capable of having contrary states, it must exhibit these states for only finite time; otherwise these conditions would overlap or be coextensive, and this is impossible (Aristotle, *On the Heavens*, I: 12, 281a 28-281b 2).

Aristotle's second main argument is based upon a logical analysis of the relevant cosmological terms. In this context we have the two extreme opposite terms: that which is always existent (AE) and that which is always non-existent (NE). Since for Aristotle "always" is convertible with "eternal" or "necessary" in many contexts (Aristotle, *On Generation and*

Corruption, 227b 35-338a 4), that which always exists is equivalent to that which eternally exists and that which is always non-existent is equivalent to that which is eternally non-existent. The question now is, Aristotle asks, what is "in between", or the intermediary term? Answer: that which is capable of existing and of not existing, i.e., that which exists at some time and does not exist at other times. (I) (Aristotle, *On the Heavens*, I:12, 282a 5-22). From this logical analysis Aristotle then proceeds to draw two corollaries which are fundamental for his cosmology: (1) the intermediary term "I" is identical with the generated and the corruptible (J); and (2) the predicates "generated" (G) and "corruptible" (C) are convertible, or interchangeable (Aristotle, *On the Heavens*, I:12, 282b 4 293a 3).

With this logical underpinning Aristotle's earlier metaphysical argument now yields the following cosmological result: since that which is the intermediary between the eternally existent and the eternally non-existent is that which is generated and corruptible, whatever is generated will sooner or later be non-existent. Hence, Plato's cosmological model of a generated but incorruptible physical universe is absurd. For in so far as it is generated, it *must* be corruptible, and thus will eventually be destroyed. Either the universe is eternal or it is generated *and* corruptible (*On the Heavens*, I: [12](#), 283a 4-7).

To these two main arguments, and the variations thereof, Gersonides responds with a detailed and rigorous critique that exposes the logical flaws in Aristotle's arguments. The various version of Aristotle's first, or metaphysical, argument either assume what Gersonides and Plato do *not* assume -- the pre-mundane existence of time, or that the world as a whole came about through natural generation, or that the thesis of a generated but indestructible universe posits the simultaneous realization or presence of the capacities of existence and non-existence. None of these assumptions is true. Neither Plato nor Gersonides hold that time existed before the creation of the universe. Nor did they believe that the creation of the world was a case of natural generation; just the contrary, it is an expression of *divine will*. Finally, neither Plato nor Gersonides was so stupid that they posited the simultaneous presence of two contradictory states. The physical universe has to be sure the possibility, or capacity, of non-existence; after all, it is not, they claim, eternal. Yet, once it exists, this capacity is, so to speak, "lost" : while the world continues to exist *ad infinitum*, the capacity for non-existence doesn't co-exist with it; indeed, this possibility is "gone forever".

Nor is Aristotle's logical analysis any more successful. Indeed, it is invalid. Yes, that which is generated and corruptible is "in between" that which is eternally, or always, existent and that which is eternally, or always, non-existent. But there are other intermediary terms: (1) that which is generated and incorruptible and (2) that which is ungenerated and corruptible. Now the latter, Gersonides, agrees, is impossible; but not the former. So there is another legitimate intermediary: that which is neither eternal nor never existent but comes into existence and continues to exist forever in the future. This is our world. Most things in our world are indeed generated and corruptible; but not all. Some, e.g., the heavenly bodies, are created but last forever. Indeed, reminding us of Book I, Gersonides cite the example of the acquired intellect, that part of the human mind that is eligible for immortality. So if the possibility of a generated but indestructible substance has been shown to be true on a micro-scale, there is no logical reason why it cannot be true on the macro-scale.

The upshot of Gersonides' reply is that Aristotle has conflated the concepts of the corruptible and of the contingent. The universe, Gersonides claims, is contingent, for it is not eternal or necessary, but it is not necessarily corruptible just because it is contingent. To be contingent is simply not to exist always; to be corruptible is to be unable to continue to exist forever after having come into existence. Our world is as a whole contingent, not corruptible; it has been generated but it will endure forever [Aristotle, *On the Heavens*, I: [12](#) has been the subject of

considerable comment in recent years. See the following works: (1) C.J.F. Williams, "Aristotle and Corruptibility", *Journal of Religious Studies*, 1(1965-66), 95-107 and 203-15; (2) S. Waterlow, *Passage and Possibility: A Study of Aristotle's Modal Concepts*, (Oxford, 1982), chap. 4; (3) L. Judson, "Eternity and Necessity in De Caelo I.12", *Oxford Studies in Ancient Philosophy*, 1(1983), 217-55].

-384-

If in one and the same thing there is a capacity [or potentiality] for some condition and for its opposite, then just as the actualization of one of the two capacities ought to occur at a time different from the actualization of the other -- since two opposite capacities cannot be realized at the same time -- so too the time of one of these capacities ought to be different from the time of the other, and each one of the times^a of these opposite capacities ought to be definite [or limited]. This is possible only if the capacities [themselves] are limited; for otherwise there would be no maximum time in which the capacity would be found. For, just as the active capacity [or potentiality] is defined by the maximum that it can perform, so too are passive capacities defined by the maximum time in which they are found; and this is the time in which the [upper] limit and completion of its passive capacity occurs.² Induction shows that this is true throughout all the categories, if we consider the capacity in its proximate, or specific, place, and not in its remote [or general], place.³ For example, Reuben could be non-existent accidentally [i.e., considered generally] for infinite time; however, his non-existence [relative to] the [specific] sperm and menstrual blood from which he is generated is temporally finite.

²Aristotle distinguishes between *active* and *passive capacities*: an *active capacity* is a power to do or make something, whereas a *passive capacity* is the power to be affected by something else (*Metaphysics*, V: [12](#), 1019a 15ff; IX:1, 1046a 12ff). For example, the sun has the active capacity to melt a piece of wax; the wax has the passive capacity to be melted.

³The notions of a capacity in its proximate, or specific, place and a capacity in its remote, or general, place are based upon two Aristotelian distinctions. (1) the *proper place* (τόπος ἴδιος; *ha-maqom ha-meyuhad*; *al-makān al-khāss*) or the *proximate place* (τόπος ὀκείος; *ha-maqom ha-qarov*; *al-makān al-qarib*) in contrast to the *general place* (τόπος κοινός; *maqom ha-kollel*; *al-makān al-'āmm*) or *remote place* (τόπος ἄλλοτριός; *hamaqom ha-rahoq*; *al-makān al-ba'i d*). For example, the Empire State Building is located on 34th Street in Manhattan, which is its proper, or proximate place. But it is also located in the state of New York, which is its general, or remote place (Aristotle, *Physics*, IV: 2, 209a 3233; *On the Heavens*, I: 7, 276a 12. Maimonides, *Guide*, I: 8, Wolfson, *Crescas' Critique of Aristotle*, 352-56). Analogously, (2) a capacity can be regarded as being either specific, or proximate (*ha-koah ha-qarov*; *al-quwwa al-qariba*) in contrast to a *general*, or remote, capacity (*ha-koah ha-rahoq*, *al-quwwa al-ba'i da*). A passage from Aristotle nicely illustrates this latter distinction:

"And there are varying degrees in which it [the soul] may be potentially that which it is capable of being -- it may be nearer to it or further removed from it (just as a sleeping geometer is at a further remove than one who is awake, and a waking one than one who is busy at his studies)." (Aristotle, *Generation of Animals II*: 1, 735a 9-12; Maimonides, *Treatise on Logic*, XI).

In this context Gersonides unites these two distinctions and arrives at a contrast between a capacity that is just about to be actualized in its most specific place and a capacity that is not yet to be actualized and is not localized in a particular region (*The Wars of the Lord*, Bk. 6, pt. 1, chap. 3).

Moreover, [Aristotle argues], it is impossible for each of [two] opposite capacities to exist in one and the same subject for infinite time and to be unlimited such that, for example, in this very same subject the capacity for existence would be infinite as well as the capacity for non-existence. For if this were possible, one of three alternatives must ensue: (1) either we suppose the activity of each opposite capacity is never realized, which is false in the case of opposites that have no intermediary, as in the capacities for existence and non-existence; or, (2) we suppose that both activities are realized simultaneously throughout all of time, which is also false, since two contraries cannot co-exist at the same time in the same subject; or (3) we suppose that the activity of one of these two capacities is realized always and the activity of the other is non-existent always. This last alternative has been thought to be possible.

Let us now suppose, for example, that the universe has an eternal capacity for existence and [an eternal capacity] for non-existence and that the capacity for existence is eternally actualized, whereas the actualization of the capacity for non-existence never takes place at all. But if this is the case, the existence and the actualization of the capacity that is always non-existent would be either possible or impossible; for the actualization of non-existence must be one of these two opposite conditions in the future. Now if we suppose that the occurrence of the activity of this capacity is impossible, there would be no capacity at all; for impossibility is the contradictory of possibility and of capacity. And if we assume that the occurrence^e of the activity of this capacity, i.e., the capacity for eternal non-existence, is possible, then, if this possibility were supposed to have been actualized, it would be a possible falsehood.⁴ But if we assume that this possibility has taken place, an impossibility [really] follows: two contrary states would co-exist. That is, one and the same thing would eternally exist and non-exist. Therefore, it is evident that what was [originally] assumed to be possible [the third of the above

⁴Remember Aristotle's distinction between a falsehood that is logically possible ($\tau\acute{o}\ \psi\epsilon\upsilon + \delta\omicron\varsigma$; *ha-kazav ha-'fshar*; *kadhib mumkin*) and a falsehood that is logically impossible, or absurd ($\tau\acute{o}\ \acute{\alpha}\delta\upsilon\nu\alpha\tau\omicron\nu$; *ha-kazav ha-nimna'*; *kadhib mumtani'*). The latter is also called in Hebrew, *Sheqer* (Aristotle, *On the Heavens*, I: 12, 281b 3 ff; *On Generation and Corruption*, I: 2, 316a 15-25; *Metaphysics*, IX: 4, 1047b 12-33; J. Klatzkin, *Thesaurus Philosophicus*, v. kazav.

alternatives] is [really] impossible. Now if this is the case, it is clear that that which exists eternally has no capacity for non-existence at all; and this is so because a thing that has opposite capacities is such that each of these capacities must be limited and finite. And thus Aristotle holds that it is impossible for a thing that has existed eternally in the past to be corruptible [i.e., destroyed] in the future.⁵

Moreover, it is impossible for a generated substance to be incorruptible. A corruptible substance is one that passes into non-being after existence, whereas a generated substance is one that^f exists after non-existence. But if a substance having eternal existence were subject to corruption in the future, it would have the capacity for non-existence for infinite time; yet this has been just shown to be absurd. Of a thing that exists always, it is absurd [to say of it] not only that it has a capacity for nonexistence for infinite time but also that it has [a capacity for non-existence] for finite time. The same consequence is involved in both cases, for what was alleged to be possible turns out to be impossible. And so when we posit a generated substance as everlasting, it would have an infinite capacity for non-existence; for a generated substance is that which exists after non-existence. Thus we have here two definitions, the one prior in nature to the other: (1) that

which receives non-existence, and (2) that which is generated and corruptible. The former is naturally prior to the latter, just as [the genus] animal is prior to [the species] man; when the former is removed, so is the latter. On this basis [Aristotle] constructs the following hypothetical syllogism: If an eternal substance is not subject to non-existence, it is not generated nor corruptible; [an eternal substance] is in fact not subject to non-existence, as has been already demonstrated; hence necessarily it is neither generated nor corruptible. Aristotle has given additional arguments; but it is proper to consider this argument first because of his lengthy treatment of it in this context.

Now Aristotle's principle, with respect to a substance having opposite capacities, that such capacities are limited is, I believe, necessarily true, just as he illustrated with respect to the specific and proximate capacity by virtue of which a subject, for example, proceeds either to generation or corruption. For it is evident that it would be impossible for such a substance to proceed to existence or to destruction over an infinite interval of time. If this were possible, the thing would proceed to a state that could never be realized, and this is absurd. And so the capacity inherent in the semen and menstrual blood for the generation of Reuben is limited. Nevertheless, it is possible even from this aspect that

⁵Aristotle, *On the Heavens*, I: [12](#), 281a 28-281b 25.

the world be generated but remain everlasting. For in assuming this we have not postulated that its generation took place over an infinite interval; indeed, as we have said before, it took place in no-time. And even if we were to admit that there was a change prior to the generation of the world, the process of generation would still necessarily be finite in time. Moreover, after the world exists, we do not assume at all that it possesses the capacity for corruption and that it proceeds towards corruption. Therefore, it does not follow from Aristotle's objection that there cannot be a generated but everlasting world. For the body from which the world has been created does not possess the capacity for corruption but only for generation, and this is self-evident. In short, if the world had been generated naturally, it would have been impossible for it be non-existent for infinite time; for natural capacities are necessarily limited. But since its generation is attributable to the will of the Creator, as has been previously shown, it is not impossible for it to have been non-existent for an infinite period and afterwards to have been generated, as has been discussed in Chapter Twenty Four of this book. ⁶

Now Aristotle might argue against us that since on this hypothesis the duration of the universe is infinite [in the future] and so too the time of its non-existence [before creation], the existence and non-existence of the world would be simultaneous, since the infinite time [of the one] is [the very same as] the infinite time [of the other]. For, if we were to assume that the period of the non-existence of the universe is infinite in the past and the period of its existence is infinite in the future, each of these infinite periods of time would be a part of the infinite of past *and* future time. But if this is so, what is infinite is a part of what is infinite, from which it follows that one infinite [i.e., the whole of infinite time] is greater than another infinite [i.e., infinite past or infinite future time]; for the whole is greater than any of its parts. Such an assumption, Aristotle believes, is absurd, as he says explicitly later on in his discussion. It follows, therefore, that each of these parts of time must be finite; otherwise, the universe would exist and not exist at the same time. ⁷

[Nevertheless], we reply that even if we were to admit that the universe had been non-existent for infinite time [in the past] and that afterwards ^h it

⁶This last point assumes for the sake of the argument that time is infinite in both directions.

⁷Assuming that there is only one infinite stretch of time, i.e., all of time, past and future, Aristotle claims that a world with a beginning but no end -- the world of Plato and Gersonides -- results in the absurdity that a whole would not be larger than any of its parts. For the world of Plato and Gersonides is temporally infinite only *a parte post*, in the future; but the future is only a *part* of time, which if infinite would be just as "big" as *all* of time. This is, Aristotle claims, absurd.

exists *ad infinitum*, it would not follow from this that it exists and nonexists simultaneously. Indeed, if time were infinite both in the past and in the future, and if the world is assumed to exist eternally (as Aristotle alleges), thenⁱ the very same absurdity [adduced by Aristotle against us] ensues. For the following disjunction is unavoidable: either [time] may be divided by a [given] instant or it may not. If its divisibility is not possible, then it is not [really] time but only an instant, since that which is not divisible in time is the instant. If its divisibility is possible, then each of its parts is infinite, and the totality would be greater than each one of them. But if it is impossible for one infinite to be larger than another, then it is impossible for time to be infinite, and this is contrary to Aristotle's thesis^j.⁸

Thus, it is evident that Aristotle would be forced to admit that the time that is infinite at one side [i.e., towards the future] but finite at the other side [i.e., the *terminus a quo* of time on Gersonides' theory of creation] is part of the time that is infinite at both sides [i.e., in the past and in the future]. This is possible, however, by virtue of the aspect of time that is finite [i.e., its *terminus a quo*, or beginning], not with respect to the aspect that is infinite. This is self-evident. Indeed, it would be false for the infinite to be a part of the infinite with respect to the aspect that is infinite [i.e., the aspect that has no terminus]; for in that aspect it cannot receive any addition. However, in its finite aspect it may be thought that it can receive an addition when infinite time is added to it, [though] not when finite time is added to it; for finite time does not add anything to time that is infinite.⁹ It is therefore evident that in this way it would be possible for the universe to endure infinitely *a parte post* [i.e., in the

⁸Aristotle has just fallen into a trap of his own making. Previously, he had argued against Plato that a "one-sided infinite", a world that is generated but indestructible, would violate the principles (1) that one infinite cannot be larger than another infinite, and (2) that a whole is larger than any of its parts. We now see, thanks to Gersonides' counterargument, that in Aristotle's cosmology these two principles turn out to be mutually inconsistent. For all of infinite time can be divided into two parts, each one of which is infinite; but the sum of these parts ought to be greater than each part, yet as infinite each part is "equal" to the sum. So Aristotle's argument against Plato as well fails to satisfy these two conditions.

⁹Gersonides' point seems to be this. We can speak of two kinds of infinities: (1) all infinite that is in no way limited, i.e., it has no terminus at all; and (2) an infinite that has one terminus but is open-ended at one side. Consider, for example, the set of natural numbers: it has a terminus, the number 1, but is open-ended, or infinite, in the other direction in so far as it has no last number. On the other hand, the set of integers, i.e., positive and negative numbers, is infinite in both directions, or at both sides. In Gersonides' argument the two infinities in question are the Aristotelian concept of time that is infinite at both sides, past and future, and Gersonides' one-sided infinite *a parte post*, i.e., time that is infinite only in the future. Gersonides now claims that although each such infinite is infinite, and in this sense equal, one kind of infinite, i.e., infinite future time, is *limited* in so far as it has a *terminus a quo*, whereas the other

infinite is not limited at all. Now because it is limited at one side, infinite time *a parte post* can be "added" to by adding from this side the rest of time, i.e., infinite past time, thus obtaining the whole of time, if we were to adopt Aristotle's theory of infinite past time. But we should keep in mind that in this context we are using the terms "part" and "add" in a loose sense; for we cannot use these terms of infinite magnitudes with their ordinary meanings.

Using the terminology employed by Crescas we could say in behalf of Gersonides that infinite future time and infinite time as a whole (on the hypothesis of eternity of the universe) are equally large in so far as they are both *immeasurable*, i.e., no definite number can be assigned to each magnitude. But in so far as infinite future time is *limited* at one end, i.e., it has a *terminus a quo*, it is "smaller than" the whole of infinite time, which has no limits (Wolfson, *Crescas' Critique of Aristotle*, 423-24. S. Feldman, "Platonic Themes in Gersonides' Cosmology," *Salo W. Baron Jubilee Volume*, (Jerusalem, 1975) vol. 1, 403 - 04. Gersonides' scholastic contemporaries were also interested in this question about the relative "sizes" of infinite magnitudes. See the discussion of Pierre Duhem in his *Le Système du monde*, vol. 7, recently translated into English by R. Ariew as *Medieval Cosmology: Theories of Infinity, Place, Time, Void, and the Plurality of Worlds*, (Chicago, 1985), pt. 1, chaps. 1-2).

-390-

future] and also to have not existed for infinite time *a parte ante* [i.e., in the past] without these two infinite periods coinciding, assuming these two periods are infinite. Accordingly, it has now been shown that it does not follow from the assertion of the non-coincidence of the times of the non-existence and of the existence of the universe that each of these times must be finite. This is quite evident. Nor does it follow from this that the universe is eternal if it is claimed to be indestructible; for we have not assumed the pre-mundane existence of time, either infinite or finite. ¹⁰Moreover, we maintain that the world is always temporally finite, even if its duration is continually increasing *ad infinitum*, as we have previously explained [in chapter 4 of Book 3]. Hence, we can now say that this ^k absurdity which Aristotle attributes to our theory i.e., that one infinite would be greater than another -- is not really implied by it. Rather, this absurdity is entailed by the theory of eternity of the universe. ¹¹

When all of this is understood, it is clear that Aristotle's objections, which we have cited, are indeed based upon [the assumption] that the two unlimited capacities are such that each obtains for all time. Accordingly, he concludes: (1) either the subject never exhibits the activity of either of these two capacities, which is absurd in these opposites that have no intermediaries [i.e., existence and non-existence]; ¹² or

¹⁰On Gersonides' theory of creation, time is created along with the creation of the world.

¹¹This is one of Philoponus' chief arguments against Aristotle (R. Sorabji, *Time, Creation, and the Continuum*, chap, 14, idem, ed. *Philoponus and the Rejection of Aristotelian Science*, chap. 9).

¹²Where the opposite properties are mutually exhaustive as well as exclusive, then one or the other of them must be true of some subject (Aristotle, *Metaphysics, IV: 7*). For example, a natural number is either even or odd, since "between" the even or the odd there is no intermediary term. In the present case, there is no "middle" between existence or non-existence. Thus, the universe exists or it doesn't exist. Now, if the contradictory states of existence and non-existence are unlimited, then either the universe exists for all time or it doesn't exist for all time; it cannot, however, be neither.

-391-

(2) that the activities of the two contrary capacities are realized at the same time throughout all time, which is also absurd; or (3) that the activity of one capacity is realized always throughout time and the other is always non-existent, which alternative Aristotle has already demonstrated to be absurd as well. ¹³ Accordingly, since it has been shown that it does not follow from the nature of time, when it is assumed that the time of each of these capacities is infinite in one respect and finite in another, that each capacity exists throughout all time, it is evident that the conclusion drawn by Aristotle here is not valid from this aspect. ¹⁴

Moreover, Aristotle's assumption ¹⁵ that it is impossible for one of the activities of these capacities to be actualized always and the other to be non-existent always -- since if this were possible the thing ^l would exist and not exist simultaneously -- is not true. For the following set of alternatives is ineluctable. (1) Either we assume that the act of one of the [opposite] capacities is always existent necessarily and the other act is always non-existent also necessarily; but if this is so, there is no possibility [at all], which is contrary to what was assumed. (2) Or, we assume that one of the acts [exists] necessarily but the other, its contrary, [exists] possibly; but this ^m assumption is self-contradictory. For example, if a thing necessarily exists but can be destroyed, then what is a necessary existent may not exist, which is obviously absurd. (3) But if we assume *each* of these acts is *possible* throughout all of infinite time, no absurdity would ensue, even if we posit that one of these acts exists always after it does not exist always necessarily. ¹⁶

¹³If a capacity is never realized throughout all of time, then it is not a genuine capacity (Aristotle, *On the Heavens*, I:12). This idea has been called the "*The Principle of Plentitude*", which was maintained in a very strong form by Spinoza (Spinoza, *Ethics*, I: 17 *Scholium*, I: 33 *Scholium*, J. Hintikka, *Leibniz on Plentitude, Relations, and the 'Reign of Law'*, and A. Lovejoy, *Plentitude and Sufficient Reason in Leibniz and Spinoza* in *Leibniz: a Collection of Critical Essays*, ed., H. Frankfort (NewYork, 1972), 155-90 and 281-34).

¹⁴Gersonides' hypothesis of a world that is finite in time *a parte ante* but infinite in time *a parte post* does not entail that the capacity for existence and the capacity for non-existence are both realized throughout all time (assuming time to exist prior to the generation of the world). For the capacity for non-existence is prior to the generation of the world; whereas the capacity for existence is posterior to its generation. Even if the two capacities are assumed to be infinite in duration, they are not, however, co-extensive, as Aristotle had incorrectly claimed.

¹⁵Aristotle, *On the Heavens*, I: [12](#), 281b 2-25.

¹⁶This is Gersonides' hypothesis of a generated but indestructible universe *as Aristotle construes it* i.e., a world that is non-existent *a parte ante* for infinite time and then is generated and existent *a parte post* for infinite time. Even within this mode of formulation -- which incorrectly attributes to Gersonides' hypothesis the notion of pre-mundane time -- Gersonides claims that this hypothesis is logically possible, contrary to Aristotle's view, because it does not assert the *necessary* actualization of the existence of the universe. No matter that the universe exists for infinite time; so long as it exists *ad libitum Dei*, it is still a contingent system.

Now we lay down the [following] for the explanation [of this point]. The definition of the possible as that which when it is asserted to exist no absurdity ensues is valid when it is asserted to exist in such a way that it could be possible, [but] not when it is asserted to exist in such a way that it could not be possible. For example, Reuben who is [now] standing has the possibility to sit, but it is not possible for him to sit *while he is standing*, for two contrary conditions cannot be simultaneously co-existent in the same subject in the same respect. Nevertheless, it would be possible for him to sit with the departure from him of the condition of standing, which is the

contrary of sitting. Now, if it is asserted that Reuben is sitting in the sense in which this is possible, i.e., with the departure from him of the condition of standing, it is evident that no absurdity ensues, for this falsehood [if it is false] is [only] a possible falsehood. But if it is asserted that Reuben is sitting without the departure from him of the condition of standing, this would be absurd, not [merely] a possible falsehood. For [in this latter case] something has been alleged to exist that cannot possibly exist.

When this point is understood, it is evident that if it were assumed that one act of two opposite capacities exists always ⁿ [but] not necessarily and the act which is its opposite is always not existent [but] not necessarily, then no absurdity would ensue from this hypothesis. For, if it is asserted that the non-existent act is realized with the departure of its opposite act, no absurdity results from this assumption, but it would be a possible falsehood, [since it was initially posited that one of these states exists *always contingently*]. However, if the non-existent act is alleged to exist without the departure of its opposite, which is the case posited by Aristotle, then quite correctly an absurdity does ensue; for something has been alleged to exist that cannot possibly exist. Accordingly, it cannot be demonstrated from the absurdity which follows from the [latter] case that what has been alleged to be possible is not possible; for in this [latter] hypothesis it was not posited that something possible exists in a way that it [really] is possible. For example, if we alleged that the world exists always [but] not necessarily and it is non-existent always [but] not necessarily, and it is alleged to be non-existent,

-393-

then it would not follow from this that it exists and not exists simultaneously; for it would not be possible for it to be non-existent while it is existent. ¹⁷ But if we had alleged that it is non-existent while it is existent, an absurdity would genuinely follow from this claim; for we posited something as existent that cannot possibly be existent. This is self-evident; a lengthy explanation would be superfluous.

It would be remarkable if this point had escaped Aristotle's notice since he was extremely wise, and it is not proper to attribute to him the failure to recognize such an obvious point. I suspect that Aristotle himself realized that his argument was not absolutely demonstrative. This is indicated by what he said after he had presented some of his arguments on this question; for it is indisputable that he thought that these arguments were not demonstrative. Thus, he says that if anyone postulates [the existence of] a generated thing that is not subject to corruption or something that exists always but is subject to corruption, it would be necessary for him to deny some of the principles and arguments which we [i.e., Aristotle] have laid down. ¹⁸ But if the denial of such principles and proofs is impossible, the proposal to reject them is necessarily impossible ^p. This observation is sufficient for anyone who understands Aristotle's discussion ^q; for Aristotle did not think that these arguments *proved* the impossibility of there being a generated but everlasting thing. And thus Aristotle's arguments on this topic have been shown to be invalid; [indeed], almost all of the other arguments he adduces after this can be disproved in this manner.

Moreover, Aristotle adduces additional arguments by means of which ^r he [tries to] prove against Plato that it is impossible for a generated thing to be everlasting. Aristotle maintains that the intermediary condition between that which exists always and that which is non-existent always must be the negation of these two extremes, i.e., it is neither existent always nor always non-existent. Therefore, the intermediate between them is that which exists at some time and does not exist at another time. ¹⁹ Whatever satisfies this condition should be generated

¹⁷To make sense out of this difficult argument I use an example suggested by Touati: Let us assume that the universe can exist always and that it can be non-existent always; in each case the situation is contingent (*lo behiyyuv*). Now consider the case when the world does not exist; i.e., prior to its existence it was always non-existent but only contingently. In this case the non-existence of the world is not simultaneous with its existence; if it were, we would have a genuine impossibility. (Touati, *La Pensée*, 294 - 95).

¹⁸Gersonides is paraphrasing here Aristotle's argument in the latter's name. However, as Touati has observed, this is not a statement made by Aristotle but one attributed to him by Averroes in his *Epitome of Aristotle's On the Heavens*, *Bibliothèque Nationale*, #935, Hebrew, folio 53r (Touati, *La Pensée*, 295, n. 36).

¹⁹Aristotle, *On the Heavens I*: [12](#), 281b, 32ff.

-394-

and corruptible, since one cannot predicate of it that it is ungenerated and incorruptible [i.e., eternal]. Now the intermediary is such that the negation of each extreme is predicable of it; thus, its nature is different from the extremes. Hence, it would seem that the generated and the corruptible does not exist always, as has been pointed out; for whatever exists always is neither generated nor corruptible. For, if we were to posit that the generated and the corruptible exists always, then something would have the capacity for existence and non-existence always, and this is absurd, as we have previously seen. Moreover, the generated and the corruptible is intermediate between that which exists always and that which is non-existent always; for the generated does not exist always nor is it always non-existent. The same is true for that which is corruptible. Accordingly, since the intermediary is that which has the capacity for existence and for non-existence and since each one of these [i.e., existence and non-existence] is interchangeable ²⁰ with the intermediary, it follows that each of them [i.e., the generated and the destructible] is interchangeable with the other. An example of this is the generated: it is that which has the capacity for existence and non-existence; and whatever has the capacity for existence and non-existence is corruptible. Hence, [Aristotle concludes] everything generated is corruptible. It can be similarly shown that every destructible thing is generated by this same kind of proof. And it follows from this that it is impossible for an indestructible substance to be generated, and conversely; and so whatever is ungenerated is indestructible, and conversely. ²¹

A further objection is raised by Aristotle. Anything that has a capacity to do [something] or to be affected [by something] is such that this capacity exists at the maximum level possible for that activity or

²⁰*Mithapekh*; literally "reversible". In this context, the term has a logical connotation: the mutual convertibility of two terms, or predicates. For example, in the sentence "Every animal is sentient", the terms "animal" and "sentient" are convertible, resulting in the sentence "Every sentient thing is an animal" (keep in mind that in Aristotelian biology only animals, not plants, have sentience). In *The Guide of the Perplexed I*: [52](#) (ed., Munk, p. 79, line 22), Maimonides uses the Arabic phrase *al-in 'ikās bil-takāfu*, which Pines translates literally as "inverting with equipoise". As Samuel ibn Tibbon explains in the glossary to his translation of *The Guide*, a sentence where "inversion with equipoise" is legitimate is such that when the constituent terms, or predicates, are converted the truth of the sentence is preserved. In our example above (taken from ibn Tibbon), the true sentence "Every animal is sentient" yields by conversion the true sentence "Every sentient thing is animal."

In the present context Aristotle claims that the terms "existent" and "non-existent" are convertible with the intermediary term "the generable and the corruptible" i.e., of that which

is generable and corruptible it is true to say that it is existent and that it is non-existent, and conversely.

²¹Aristotle, *On the Heavens, I*: [12](#), 282b 1-2.

-395-

affectability or ²²[it exists] in the things at the maximum level of that activity or affectability. Whatever is of this sort has a capacity that is limited, according to what has been laid down earlier. But whatever is of this description and has a capacity for generation and corruption is such that the time in which it is susceptible to generation is limited; and the same is true for the time in which it is susceptible to corruption. Therefore, the capacities of things that can receive generation and corruption are finite. For in an existent one of two things must be the case: either its capacity is infinite or finite. Now the finite is limited since it has a beginning and an end; but the infinite is unlimited, unless someone were to say that even the infinite is limited, since there is nothing greater than it. ²³But if there is something that is everlasting but generated there would be an infinite capacity that is finite. [However], whatever is infinite is not divisible into some things which are infinite only in the past, some things which are infinite only in the future, and some things infinite in both parts [of time]. This would imply an improbability: one infinite would be greater than another infinite; for the sum of both capacities would be infinite and yet ^t each one of them is infinite. Moreover, it would follow from this that what is infinite would be a part of what is infinite. If someone were to reply that in generated and corruptible things infinite capacities can be present, Aristotle would maintain that the absurdity mentioned in his initial starting point would result, i.e., that which was [alleged to be] possible is in fact absurd. ²⁴ Accordingly, Aristotle believed that it is not possible for a generated substance to be indestructible and for a destructible substance to be ungenerated. Aristotle employed other arguments in behalf of this thesis; but we shall examine the ones already cited before we mention the others. This procedure is warranted by the great number of arguments employed by Aristotle on the question.

²²The wording of this principle is difficult. It seems to be based upon *On the Heavens, I*: [11](#), 281a 19-26, especially 281a 24-25; but it is not an exact reproduction of Aristotle's text.



The Greek text of 281a 24-25 reads: *διωρίσθω γὰρ ἥτοι ἐπὶ δυνασεως ἢ ἐπὶ τοῦ + ἰπραγσατος ἢ ὑπερβολή* -- "for the maximum as defined may be *either* in the power or in the object." (Trans., Guthrie in Loeb edition). Assuming that Gersonides is reproducing Aristotle's argument here, I suggest that before



("or"), which corresponds exactly to Aristotle's text. Or, one can construe the



as "or", which is not uncommon in classical Hebrew.

²³According to Aristotle, this latter idea is a common but mistaken conception of the infinite (Aristotle, *Physics, III*: [6](#), 206b 35-201a 14).

²⁴Aristotle, *On the Heavens, I*: [12](#), 281b 3ff.

-396-

Concerning Aristotle's argument -- that the intermediate condition between [the two extreme conditions of] existing always and non-existing always is not existing always and not non-existing always, i.e., existing sometimes and not existing sometimes, and that such a thing is generated and corruptible, since it is not true of it that it is ungenerated and incorruptible -- we maintain that it is not valid. For of a generated [but] incorruptible thing it is true to predicate "not always existing" and "not always not existing", or "exists and not exists" [not simultaneously]; and this is also the case with an ungenerated but corruptible substance. Accordingly, it doesn't follow that of the intermediary condition between these two extremes it must always be true that it is generated and corruptible; rather, it must be either generated *or* corruptible. For if a substance were neither generated nor ^u corruptible, it would exist always, unless ^v Aristotle were to say that by virtue of their unlimited contrary capacities it would follow that each one of them is manifested for all time, as has been suggested earlier. [In that case,] therefore, the generated [but] incorruptible, for example, would always exist absolutely or always be non-existent, if we were to assume that the capacity for nonexistence is always actualized. But if Aristotle's conclusion here pre-supposes his earlier presentation of this topic, it has already been shown by our own discussion that Aristotle's argument is not valid, and there is no need to repeat our argument. ²⁵

How the generated and indestructible or the destructible but ungenerated are such that of both of them it is true to say they are neither always existent nor always non-existent or sometimes exist and sometimes do not exist -- and this is the intermediary between the always existent and the always non-existent -- will now be demonstrated. The term "existent" is more comprehensive than the term "generated" ; for the former predicate is true of the generated existent, i.e., that which exists after non-existence, and of the ungenerated existent, i.e., that whose existence is not preceded by non-existence. Analogously, the predicate "non-existent" is more comprehensive than the predicate "corruptible". For it is true of the corruptible, i.e., that which existed before its destruction, and of that which was always non-existent in the past, i.e., that whose non-existence was not preceded by its existence. Hence, it is evident that the terms "existent" and "non-existent" are true of a

²⁵Earlier in this chapter Aristotle claimed that the thesis of a generated but indestructible universe presupposes that such a universe has an unlimited capacity for existence and an unlimited capacity for non-existence. Aristotle then argued that such unlimited capacities would have to be actualized together throughout all of time, which is absurd. Hence a universe that is generated must have a limited capacity for existence. This argument has, however, been shown to be invalid earlier in this chapter.

generated and incorruptible thing: the latter is existent in so far as it is generated, the term "existent" being predicable of the generated, as we have just shown; and ^x it is non-existent in so far as it was always non-existent in the past, the term "non-existent" being, as we have seen, predicable of that which is always non-existent in the past. Analogously, these two terms are true of an ungenerated but corruptible substance, but this does not require proof. Indeed, in both cases, i.e., the generated but incorruptible and the ungenerated but corruptible, it is true to say that they are neither always existent nor always non-existent. Accordingly, it is not necessary that the condition intermediate between the always existent and the always non-existent be the generated and the destructible, as Aristotle maintains.

If Aristotle argues that the intermediary between them is the generated and corruptible because its nature is different from the nature of the extremes such that it is the negation of them, as he

has said, and hence does not at all share with them the feature of having no limit, this is a very weak argument. For in this very same manner it can be shown that the nature of the intermediary is related [i.e., similar] to the nature of the extremes, and hence the two features characteristic of the extremes would be true of the intermediary. For of the intermediary it is true to say that it is existent and non-existent; hence, its nature is related to the nature of the two extremes. For the intermediary between two things is necessarily such that either the affirmation or negation of both these things [i.e., features] is true of them. ²⁶This is self-evident and is stated by Aristotle in many places. ²⁷

Moreover, Aristotle's claim that the predicates "generated" and "corruptible" are convertible since they are convertible of the intermediate term between "always existent" and "always non-existent" (and this ^z is something that has the potentiality for existence and non-existence), is evidently not true. ²⁸For, "whatever has the potentiality for existence and non-existence", i.e., that which sometimes exists and sometimes does not exist -- which is the intermediate between the "always existent" and the "always non-existent" -- is a more general term than "the generated" or ^{a1} than "the corruptible". The term "existent and non-existent" is ^{b1} more comprehensive than the term "the generated", since the former is true of both the generated and the ungenerated but destructible, if there are such things of this latter sort. Similarly, the term "existent and non-existent" is more comprehensive than the term "corruptible" ; for it is

²⁶That is, an intermediary can be described either as that which is neither extreme or as that which has something in common with either extreme.

²⁷Aristotle, *Metaphysics*, X: 7.

²⁸Aristotle, *On the Heavens*, I: 12, 282b 9 ff.

true of both the corruptible and of the generated but incorruptible. Hence, it follows that the terms "generated" and "corruptible" are not convertible. For while it is true that each generated thing is existent and non-existent, it does not follow that whatever is existent and non-existent is corruptible. Therefore, it does not follow from this that every generated thing is corruptible. Similarly, it can be shown that from Aristotle's argument it does not follow that every corruptible thing is generated. For it is true that every corruptible thing is existent and non-existent; [but] it does not follow that every existent and non-existent thing is generated. Therefore, it does not ^{c1} follow from this that every corruptible thing is generated. I believe that Aristotle made this claim because he already had laid ^{d1} down the principle that it is impossible for two opposite and unlimited capacities to be present in one and the same subject. Accordingly, he concluded that whatever has the capacity for existence and non-existence is generated *and* corruptible. For this reason he repeated this principle and provided an additional proof by means of it. But we have shown earlier that this principle is not necessarily true; hence there is no need to reply to him in this context.

Aristotle advanced many additional arguments in behalf of his thesis that it is impossible for a generated substance to be everlasting. Firstly, if there were something that is eternal in the past but corruptible in the future, there is no doubt that its capacity for corruption precedes in time the corruption; and since it existed always in the past, it was potentially corruptible throughout *all* of infinite past time. But if this capacity [for corruption] existed throughout infinite time, there was no particular moment that was naturally [propitious] for its corruption; on the contrary, its corruption was indifferent to all of these moments, which are infinite. If this is the case, then when we claim that it is corruptible at *any* of the infinite moments in past time, we have put forth an [apparent] false possibility that really turns out to lead to an absurdity. ²⁹Therefore, it also

follows that there is nothing that is generated but everlasting in the future; for a generated substance necessarily possesses the capacity for generation before its generation throughout all of infinite past time, [and at *any* time in the past this capacity could have been realized, and hence this thing would have been eternal in the past].

Secondly, if there were things that could be either eternal but corruptible or generated but everlasting, it would follow that the corruptible would be incorruptible and the existent would be non-existent. For if we do not maintain that the time of generation is different by nature from

²⁹Such a substance *could not have been* eternal, since at *some* point in infinite past time it would have been destroyed.

-399-

the time of corruption, the possibility of its corruption and its generation would be the same throughout time; and it would follow either that it would be generated and corrupted at the same time or not generated nor corrupted at the same time, as has been explained. But all of this is absurd. Indeed, Aristotle reached this conclusion since he posited the principle that opposite capacities which are unlimited would each exist throughout all time. And when he joins to this principle [the assumption] that this possibility has been actualized, an absurdity results, i.e., what was assumed to be possible is impossible. ³⁰

Thirdly, Aristotle claims that it is impossible for a generated thing to be incorruptible and an ungenerated thing to be corruptible. For a thing that is ungenerated and incorruptible is such that its existence in this condition cannot be fortuitous or spontaneous; rather it must be such by nature [or essentially]. ³¹The difference in the natures of things is the cause why some of them receive generation and corruption, whereas others do not. But if a substance has the nature to receive generation and corruption, it is impossible for it to be everlasting. Similarly, if it has the nature to receive eternity, it is impossible for it to be corrupted; unless it were possible for a necessary nature to become a possible nature. Now this argument is the strongest of all the objections heretofore raised by Aristotle. And if someone were to object that the capacity for non-existence in a generated but everlasting substance refers to past time [only] and that all of the previous absurdities adduced by means of all or most of these principles against the hypothesis of a generated but everlasting world would therefore not hold, Aristotle would respond to this objection [as follows]. He would say: it is obvious that the phrase "something has a capacity" is intended to refer to future time. If our saying "something has a capacity" was understood such that the capacity refers to past time, then past and future time would become one, which is absurd. ³²

Another argument: by induction we observe from individual existing things which are generated and corrupted that every thing generated is corruptible, and conversely. This can be seen by examining all the four types of change. Further confirmation can be obtained from realizing that generated and corruptible things have contrary states, whereas it is inappropriate for the everlasting to have a contrary state.

³⁰The hypothesis of a substance that is either generated or corruptible but having a capacity for infinite duration either in the past or future is, Aristotle argues, not a genuine hypothesis, since it leads to a logical absurdity.

³¹Aristotle, *On the Heavens*, I: [12](#), 283a 30-283b 4.

³²Aristotle, *On the Heavens*, 283b 6-17. Gersonides, *The Wars of the Lord*, Bk. 6, pt. 1, chap.

Finally, Aristotle supports his view by appealing to the common agreement of ancient peoples and of preceding generations that the heavens among all existent things are the abode of God because of their belief in the eternity and incorruptibility of the heavens.³³ But this argument shows that Aristotle was aware of the weaknesses of all his arguments; hence he relied upon the support of the ancients in this belief. If this view had been philosophically demonstrated, there would have been no need for such support.

Reply to the first argument i.e., if there were a generated but everlasting substance, since it would possess the capacity^{e1} for generation at every instant in infinite past time, it would have been possible for it to be generated at any of these instants in past time; and if this possibility is alleged to be actually existent, an absurdity, ensues: the universe would be simultaneously existent and non-existent, and this is absurd.³⁴ The solution to this objection is evident from our earlier discussion; for this possibility [envisioned in our theory] is not possible in the way that it has been posited as existent [by Aristotle].³⁵ It might be objected against us that although we have not posited the existence of a capacity along with its opposite capacity, yet [another] absurdity results from our theory: the generated turns out to be ungenerated. For, when it was alleged that something may be generated throughout any of the moments of infinite past time, it follows that the generated is not generated [but eternal]. But this is absurd.³⁶ We maintain, however, that this is not so. For, if it is

³³Aristotle, *On the Heavens*, I: 3, 270b 5-20; II: 1, 284a 12-13.

³⁴In this objection, Aristotle argues that the hypothesis of a generated but everlasting universe is *ab initio* an absurdity such that it doesn't deserve to be taken seriously. For the state of affairs it postulates is a contradiction in terms: such a system would be simultaneously existent and non-existent throughout infinite past time -- existent because of its capacity for generation, non-existent because of its capacity for non-existence, which *ex hypothesi* is actualized until it is in fact generated. The same logical point will be adduced in the second objection.

³⁵Even if it were assumed, as Aristotle does but Gersonides does not, that time is infinite in the past, the Gersonidean model of a generated but everlasting universe does not lead to the absurdity that Aristotle alleges: that it would be simultaneously existent -- in so far as its capacity for generation is realizable at any moment of the infinite past -- and non-existent -- in so far as it is *ex hypothesi* generated at a definite point in time i.e., it is not eternal. This absurdity does not infect, Gersonides replies, his theory; for this theory does not assume the possibility for generation is present in the way that Aristotle does. Since creation is a case of voluntary generation, whereby the maker freely produces something whenever it wishes *ad libitum* agentis, the possibility for generation that allegedly exists throughout all of infinite past time is "present" only in the maker, God. Even if it were assumed that prior to creation time existed, the possibility for creation didn't have to be realized at each and every moment of infinite past time, since creation is a case of voluntary generation (Gersonides, *The Wars of the Lord*, Bk. 6, pt. 1, chap. 24).

³⁶Again the objector argues on the assumption that time is infinite in the past: if throughout all of infinite past time the universe could have been generated, then it is really ungenerated, i.e., eternal. For, if it was generated at *any* of the moments of infinite past time, then since no moment was more propitious for its generation than another, it was generated at *each* moment; i.e., it is *eternally* generated, or perpetual. But it was assumed by Gersonides that the world had a definite beginning, i.e., it is not ungenerated even in the weaker sense of being perpetual. Thus, even if we set aside whatever capacity for non-existence such a world might

have, a universe that has the capacity for generation or existence throughout infinite past time is really ungenerated, i.e., it is eternal!

-401-

assumed that there is time prior to the creation of the universe, it is evident that at any moment of the infinite moments in the past it would be possible for the world to be generated; now, if it is assumed that the universe was generated at some such moment, it would be existent *after* nonexistence. Hence, it does not follow from this hypothesis that the generated is ungenerated. ³⁷

Concerning the second objection [if indefinite capacities are postulated, e.g., existence and non-existence, they would be co-existent], we reply that it rests upon the assumption that when opposite capacities are present in a thing each of them obtains throughout all of time. But we have already shown that this assumption is not necessarily true. Moreover, this objection posits a possibility as existent in such a way that it is [obviously] an impossibility. Accordingly, if an absurdity follows from this assumption, it does not follow from what has been assumed [by us] as a [genuine] possibility, that it is impossible, as we have already pointed out. ³⁸ Someone might reply that [the objection] did in fact posit this possibility in such a way that it is, [at least *prima facie*], possible ^{fl}. For, since each one of these capacities obtains for all time, it is clear that the existence and non-existence of the universe are possible [states of affairs] in each moment of time. But if this possibility were assumed to be actual, an absurdity would ensue: the world would exist and not exist at the same time. Hence, what was assumed as possible will ^{gl} be impossible [i.e., the hypothesis of a generated but indestructible universe]. This objection, however, is not correct. It was possible in each of those moments [of infinite past time] for the world to have been existent *or* non-existent, but not existent and non-existent simultaneously. Accordingly, the objection assumes an existent state of affairs that is not a genuine possibility.

³⁷Even if it is assumed for the sake of argument that time is infinite in the past, it is not the case that Gersonides' model of a generated but incorruptible universe leads to the alleged absurdity of a world that is eternally present throughout infinite past time. His model would only imply that at *some* moment in the infinite past, the universe was generated *after not having been in existence*. Thus, the world does *not* exist throughout all of infinite past time, assuming that time is infinite in the past.

³⁸Contrary to this objection's claim, Gersonides' hypothesis of a generated but everlasting universe does *not* postulate a state of affairs that is *obviously* contradictory. If it is so self-contradictory, it has to be proven such, and Aristotle has not done so.

-402-

Indeed, this [kind] of absurdity clearly pertains to any possibility. For that which does not exist but could exist is such that it may exist and may not exist [i.e., it is a possible, or contingent, being]. If it is not assumed that it may not exist, it would be correct to say that it is impossible for it not to exist, which is its contradictory. Hence, that which was [alleged *ab initio*] to be a possible existent would be a necessary existent, which is absurd. Accordingly, it is clearly correct to say of it [i.e., that which does not exist but can exist] that it may exist and may not exist. But if this possibility is assumed to be existent at the same time, an absurdity does ensue; indeed, this ^{hl} would be the case because something would be posited as existent that is [*ab initio*] an impossibility. For it was possible for it to exist or not to exist, but not simultaneously; the latter is an obvious impossibility. ³⁹

Someone might [still] object that it is impossible for something generated to be everlasting, since that which receives non-existence is prior by nature to [that which] is generated, as Aristotle has mentioned earlier ³⁹. Accordingly, the universe [on this hypothesis] would have the capacity for non-existence, and whatever has this capacity is not ever-lasting. But it was alleged that the universe is everlasting, which is absurd. Nor would it do [in reply to this objection] to say that its capacity for non-existence refers to past time, and thus this absurdity would not ensue; for a capacity by its very nature clearly refers to the future, as Aristotle has pointed out. ⁴⁰ To this objection we reply that the [body] from which the universe has been generated does not necessarily receive non-existence. However, it receives generation when the agent so wills; it does not by itself have the principle either of generation or of corruption, as is evident from its very nature. Now this possibility [to receive generation] exists before the [actual] reception of the generation. However, after its reception of the generation it has no possibility at all; for if it had the possibility for corruption, this possibility would have to exist by virtue of the agent, since in itself it has no such possibility. But it

³⁹If the objection were valid, there would be no such thing as *possibility*. For a possible state of affairs is such that it can, *ex hypothesi*, exist or not exist. Now, if someone were to claim *ab initio* that such a state of affairs is contradictory because such a state of affairs has the capacities for existence and non-existence, then all existent things would be necessary or impossible. But this is a *petitio principii*.

In these two counter-arguments Gersonides claims that Aristotle's objections are "cheap-shots". For they construe Gersonides' hypothesis of a generated but everlasting universe in such a way that *ab initio* this hypothesis is self-contradictory. Perhaps, Gersonides suggests, my hypothesis may be false; but if this is the case, it has to be shown in a fair manner, and not by formulating the theory in such a way that it is absurd on the face of it (cf. Touati, *La Pensée*, 295).

⁴⁰Aristotle, *On the Heavens*, I: [12](#), 283b 13-14.

has been indubitably proven that there is no possibility for corruption ⁴¹ by virtue of the agent! In general, non-existence is a natural feature of the body from which the universe was generated, in so far as it is intrinsically devoid of any [particular] nature and remains with this defect until God bestows it with the natures that it exhibits. Hence, it is clear that the possibility that it has is the possibility for receiving generation, not for non-existence. ⁴¹

Aristotle's [third objection] maintains that something is generated or corruptible by virtue of its nature in so far as it exhibits contrary qualities. Hence, every thing generated is corruptible; since the nature that necessitates its generation necessitates its corruption, as is evidenced by sub-lunar phenomena, which are all generated and corruptible. But just as the universe has no nature for corruption, since it has no contrary, so it has no nature for generation either. Thus, the universe is not generated. We maintain, however, that this argument does not entail that the universe is ungenerated. We admit that the universe does not have a nature that entails its generation and its corruption, since it has no contrary; [yet] this does not preclude the possibility of its creation in the manner previously explained [i.e., by a free act of God]. In chapter 26 of Book Six, Part 1, it was pointed out that it is not impossible for the world to have been created [simply] because it has no contrary. If it be objected that the very nature that necessitates its generation, i.e., the will of God, ought to necessitate its corruption as well, as we observe in sublunar phenomena, where the nature that necessitates generation also necessitates corruption, we say in reply that this objection is quite feeble. For it has been demonstrated that it is of the nature of God to bestow

existence and good, not corruption and evil. It is of the nature of a contrary, however, to be the instrument of generation and corruption. Indeed, it can be observed even amongst things generated by will, i.e., artifacts, that they have no capacity for corruption in so far as they are generated by a craft. For example, it is not the case that a chair made by

⁴¹It might be thought that the primordial body from which the universe was generated has the capacity for non-existence and that such a capacity is a "dominant gene" and hence would sooner or later emerge, thus resulting in the destruction of the universe. Gersonides replies that this body has the capacity for non-existence only in the sense that it is *per se* bereft of any intrinsic form; it receives form, however, from God, and this reception of form is in the act of the generation of the world. Hence, this body has the capacity to receive generation *a parte agentis*. Once the world is created, this possibility no longer exists because now the world is actual. Nor does it have the possibility for corruption; for as possessing no intrinsic form it has no intrinsic possibility for generation or corruption, and the agent couldn't be the cause of corruption, as Gersonides had earlier proved in Chapter 16 of this Book. The primordial matter is then a substratum for generation and nothing else.

-404-

the skill [of carpentry] is inevitably corruptible merely because it has been made by this skill; rather, it is corruptible because it is made from wood, which is a natural body composed of contraries.

[Finally,] Aristotle's appeal to the *consensus gentium* of the ancients to the effect that the heavens are the abode of God requires no reply. Truth is not weakened by [the appeal to] the *vox populi*, [which favors] the contrary view. Moreover, this contention does not differ from our view of creation; for we too say figuratively that God is in the heavens, since celestial phenomena are by far much nearer to His level [of perfection] than are terrestrial phenomena.

And so it has been demonstrated that Aristotle's arguments do not prove the impossibility of something generated to remain everlasting. It is quite surprising that Aristotle's commentators believed these arguments to be truly demonstrative, as a result of which they claimed that the acquired intellect is corruptible. But this is utterly mistaken; i.e., that something is corruptible that lacks the causes of corruption. It can be easily shown that the acquired intellect is not corruptible, since it lacks the causes of corruption, as is evident from its very nature, and whatever lacks the causes of corruption is incorruptible. Thus, by the first figure [of the syllogism] it can be shown that the acquired intellect is incorruptible. ⁴²

⁴²Gersonides, *The Wars of the Lord*, vol. 1, Bk. 1, chaps. 11 and 13. This critique of Aristotle's *On the Heavens*, I: 12 should be compared with that of Gersonides' younger French contemporary Nicholas Oresme [N. Oresme, *Le Livre du ciel et du monde*, trans., and ed., A. Menut and A. Denomy, (Madison, 1968)].

-405-

CHAPTER XXVIII

ARISTOTLE's ninth argument against the possibility of creation is based upon the impossibility of *everything* being subject to generation. Everything that is generated is either a body or a feature of a body. Now if everything were generated after it had not existed, it would follow that

matter in its entirety would be generated *ex nihilo*.. This implies the prior existence of a vacuum in which the body will be created, for the place [of a body] is necessarily created [along with the body]. ¹Moreover, creation of matter from no matter at all is absurd. Similarly, creation from a body in potentiality, i.e., from a formless matter, is [absurd]. For matter cannot be deprived of form; since if this were possible, that which cannot exist in actuality would actually exist -- which is absurd. Thus, body cannot be generated. ²

We have already demonstrated in Chapter Eighteen of this Book that the creation of the world from a body devoid of any form is not impossible. It is impossible, however, for the sub-lunar matter to be bereft of any form, since the elemental forms are always and necessarily found in it. But before the creation of the world, when these nature's forms were not present, it was not impossible for [the primordial matter] to be devoid of any form; indeed, it was necessary ^a [that it should be formless], as we have already shown. It is important to note that the possibility in the first matter to receive all forms is necessarily due to these aforementioned forms; which we mentioned above; for it is impossible for matter to have a possibility without [some] form. If the first matter had the possibility [to receive forms independently of the elementary forms], it would receive all forms indifferently, which is absurd. For a possibility is for a specific thing. In general, a possibility inheres in a thing with a specific form and is for a specific form; for example, copper has the possibility to become verdigris. In this manner, the first matter is capable of receiving all forms some by means of others, by virtue of the nature's [i.e., elementary forms] inhering in it, changing from one mix-

¹According to Aristotle's theory of space, the place of a body is *defined* by that body i.e., it makes no sense, for Aristotle, to talk of the place of a body without reference to the body (*Physics, IV: 4 - 5*). Bodies, then, individuate places. Now if matter in its entirety had been created from nothing, its place would have been created along with it. This means that prior to creation a vacuum would have existed in which no places would have been individuated but which is occupiable by bodies.

²Aristotle, *On the Heavens, III: 2, 301 b 31 - 302 a 9*.

-406-

ture to another through them, losing a form and taking on a form appropriate to that mixture.

With the solution of this difficulty we have finished our discussion of all the problems raised by Aristotle against the doctrine of creation. We have previously solved the other problems that might be raised against this universal creation in a manner which has been shown to be true. And so our examination of this problem has been completed. We have demonstrated by many proofs the creation of the universe and have resolved all the objections to it by means of what we have actually proved concerning the nature of this creation.

Thus, we have completed in a philosophical manner our investigation into the speculative questions that have been the subjects of this book.

-407-

CHAPTER XXIX

IT is fitting that we now take note of what we have accomplished in this book with respect to these profound questions ^a. What we have found in the ancient writers has prevented ^b more than helped us in the attainment of the truth in these matters. What we find in Aristotle concerning

immortality of the soul is not sufficient to prove either its possibility or impossibility. Indeed, all he says is that it is proper that we investigate this matter, as he says in *On the Soul* and in the *Metaphysics*.¹ But we do not find that he [actually] discussed this question at all. The later philosophers who believed in immortality [in some sense] were forced to admit that the acquired intellect was corruptible; hence they believed in immortality in the sense defined by the wise philosopher Averroes in the essays he wrote [on this topic]. [However], it is evident that it is impossible for man to attain the level [of perfection] possessed by the Agent Intellect. Moreover, even if this were so, there would be no happiness at all for the human soul if immortality were of this sort.² With respect to [the problems pertaining to] dreams, divination and prophecy, we have found only a brief discussion in Averroes' *Short Commentary on Aristotle's On the Senses*, and it is not at all adequate, as has been already demonstrated.³ Moreover, these topics are extremely difficult. Concerning the problem of divine knowledge, of all our predecessors only Maimonides has anything worthwhile to say. But, as we have shown, his views are not correct either.⁴ The same is true in the question of providence.⁵ Nor have we found in our predecessors an adequate theory of the heavenly bodies, as we have demonstrated.⁶ This is also true with respect to the causes of various astronomical phenomena, some of which are not mentioned at all by the ancients and some are treated [only] inadequately, as we have indicated.⁷ With respect also to the movers of the heavenly bodies, the First Cause and the relationship amongst these movers, we did not find in our predecessors an account that fits the facts, as we have

¹Aristotle, *On the Soul*, III: 5; *Metaphysics*, XII: 3.

²For it obliterates human individuality (Gersonides, *The Wars of the Lord*, vol. 1, Bk. 1, chap. 11).

³Supra, Bk. 2.

⁴Bk. 3.

⁵Bk. 4.

⁶Bk. 5, pt. 1.

⁷Bk. 5, pt. 2.

-408-

explained.⁸ Finally, concerning creation of the universe we did not find in any of our predecessors a true philosophical account, other than what is found in the Torah by way of tradition. What we have found in Maimonides almost closes the door against this inquiry. For he advances a theory of creation that is clearly impossible [i.e., creation *ex nihilo*], and in addition declares that it is impossible for man to reach the truth on this topic by philosophical means. It is therefore quite marvelous that we have actually succeeded in solving these extremely profound problems and in eliminating all the doubts pertaining to them. It is proper, therefore, to give thanks to the Lord (may He be blessed) Who has revealed to us these marvelous and profound truths. May He be eternally blessed and exalted beyond all praise and blessing.

⁸Bk. 5, pt. 3.

-409-

COLOPHON

THIS part of this Book was completed in the beginning of Shevat 5089 [1329]. The reader should wonder when he notices the completion date of this Book [i.e., Book 6, part 1], and then observes, on the basis of what he reads in our other works, that we wrote this book more than

eight years before the above date. For we [began] to write this treatise [i.e., *The Wars of the Lord*] for ourselves, about twelve years ago; but [in the original version] it was entirely devoted to the question of the eternity of the universe, and its creation. When it was necessary for us to include proofs of some of the philosophical principles, of which our predecessors were silent, it turned out that we were unable to present a complete treatment of these principles; hence, the book would have been quite obscure and hardly of any value to the reader. [But] when during the course of time we realized that there was no way to complete such a book, we decided to write this [present] book in its [present] form. For all of these various issues throw light on each other, and accordingly the book will be of great value to the reader.

-410-

SYNOPSIS OF BOOK VI

Part 2 -- Theological Addenda

IN his Introduction to the *Wars of the Lord*, Gersonides tells us that he will append to the six main books of his treatise a discussion of two additional questions: (1) what is the nature of and who is the agent of miracles?; (2) how do we test a prophet? In the description of the contents of Book 6, part 2 he characterizes these questions as "religious" (datiyyot). From a purely organizational point of view it might be thought that it would have been better to have put these topics into a separate book entitled "*On Miracles and the Role of the Prophet in Them*". Nevertheless, there is here a philosophical point of continuity with the earlier parts of Book 6 and the topic of creation. Creation implies for Gersonides God's *freedom to act*. That the universe is created entails that it is not a necessary fact. Miracles too are contingent phenomena; for if they were necessary facts of nature, they would not be "abnormal" and extraordinary, since the necessary is that which is regular and ordinary. Thus, like the creation of the universe, the occurrence of a miracle is an expression of contingency, of God's free action. Accordingly, these chapters do have a connection with the topic of creation, and thus belong in Book 6.

The problem of miracles became especially acute when the philosophical tradition of the Greeks came into contact with the religious world of the Bible. The Aristotelian and Stoic cosmologies of relatively fixed natural laws do not seem to be appropriate abodes for the belief in extraordinary phenomena that run counter to the order of nature. Yet what would Judaism be, as well as its daughter religions Christianity and Islam, without the belief in miracles? Revelation itself is a break in the order of nature; in a special sense creation too is a miracle, since it is not a natural type of generation. How, then, were the medieval philosophers -- who were wedded both to a religious tradition and to some philosophical theory -- going to bring miracles and natural law together into one dwelling place?

Before plunging directly into this problem, Gersonides begins with a methodological, or epistemological, note. Miracles are empirical phenomena; they are observable events which occur within nature; indeed, if they are not observed, they would be without any point. Yet, miracles have happened rarely during the long history of mankind, and they

-411-

seemed to have occurred a long time ago, certainly beyond the personal experience of Gersonides or of any of his contemporaries. We are thus faced with an epistemological problem: the phenomena in question are *ex hypothesi* empirical; yet we ourselves do not have any direct observational evidence for them or, at least, for the miracles that Gersonides is especially concerned with. But we are not bereft of guidance; for there are analogous instances in the sciences and we haven't given up hope in those domains. Ptolemy, for example, used the

observations of his predecessors in his own astronomical work, as did Aristotle in biology. In these cases Ptolemy and Aristotle proceeded on the assumption that their evidence came from reliable sources; the same is true in the case before us. Our accounts of miracles have come down to us from reliable witnesses, the Prophets and their disciples, and their reports have been safeguarded and transmitted to us by authorities whose trustworthiness is irreproachable. Moreover, one could add, although Gersonides does not do so here, that since Christianity and to some extent Islam both accept the authenticity of the Bible, the miracles recorded therein have been attested to by billions of people throughout history. ¹ We can then take the accounts of miracles reported in the Bible as reliable and proceed to determine their nature and who it is that performs them. ²

In order to appreciate the nature of a miracle we have to understand first the sense in which a miracle is unusual. We indicated earlier that a miracle is usually understood as an exception to a law of nature. But there are limitations, Gersonides claims, to what can happen. A miracle cannot violate a law of logic or of mathematics; for such laws define the very nature of logical possibility. A miracle is therefore a rare event that *can* happen, i.e., it is logically possible for such an event to occur, although it does so seldomly. Accordingly, don't ever expect to find a Euclidian triangle whose interior angles do not equal 180°. Nor will you ever see an apple that is both on its branch and at the same time falling. Miracles occur then within the domain of logical possibility. They are, in Gersonides' language, "possible in themselves". On the other hand, given a specific set of scientific laws, or a definite system of nature, these general logical possibilities are curtailed or reduced; for, given the speed of light as a physical constant, it is physically impossible for a rocket to travel faster than the speed of light. In other words, a physical theory sets certain limitations on what is *naturally possible*. Thus, Gersonides says, although the generation of a snake from wood is itself logically pos-

¹Jehudah Halevi uses this argument to good effect (J. Halevi, *The Kuzari*, Book I: 11-25).

²David Hume rejected this assumption (D. Hume, *An Inquiry Concerning Human Understanding*, chapter 10).

sible since it violates no law of logic, it is, given the laws of nature of our world, *naturally impossible*. ³ But to say that something is naturally impossible is merely to say that it is highly improbable or unheard of; it is not to preclude its occurrence, since its occurrence falls within "logical space". Moreover, as an improbable natural occurrence a miracle is not only rare but it is either momentary, like the earth swallowing up Korah and his gang, or endures for a relatively limited period of time, such as the failing of Mannah from the sky for *forty* years. If a miracle were to last for a very long period, it would cease to be extraordinary and would be natural. ⁴

Another general attribute of miracles is their purposiveness. Miracles are part of the providential order; they are manifestations of God's concern for mankind. It would be ludicrous for God to bring about a miracle that is devoid of any utility; indeed, it would be "teleologically impossible" for Him to do. Because miracles are performed *for* man, they must achieve some end.

However, throughout these concluding chapters Gersonides' main concern is not so much with miracles themselves, which he discusses in greater detail in his biblical commentaries, but with the *agent of miracles*. By the term "agent" he means the proximate, or immediate, cause of the occurrence of the miracle. At first sight it is not altogether clear why this should have been such an important issue to Gersonides. It was not such a vexing problem for Maimonides, for example; nor indeed did it exercise the theological imagination of the Rabbis of the Aggadah.

Indeed, in the Bible, the performance of miracles appears to be ascribed to God, to the prophets or occasionally to an angel. Perhaps it was this indiscriminate way of ascribing the performance of miracles to all these agents that disturbed Gersonides. More likely than not, this "permissiveness" appeared to be inconsistent with certain philosophical theses that were dear to him. Perhaps, too, this topic is relevant to the problem of testing the prophet, the topic with which Gersonides concludes his treatise. Whatever his motive or motives, he presents a lengthy discussion of this issue in part 2, chapter 10, the conclusion of which is far from being unexciting and trivial, as the question may appear.

³Gersonides, *Commentary on the Torah*, Exodus 6.2.

⁴This distinction between events that are in themselves possible and events that in the context of our normal laws of nature are impossible, or improbable, was implied in a fairly common conception of divine omnipotence employed by many medieval thinkers. Maimonides, for example, defines God's power as the ability to do *what is doable*, and the latter ability is defined by the domain of logic (Maimonides, *Guide*, III:15; Thomas Aquinas, *Summa Contra Gentiles*, II:22). To say then that God *can* perform miracles is to say that he has the power to contravene a law of nature, but not the power to do what is logically impossible; for there is no such power.

Gersonides considers three possible agents of miracles: God, a lower order separate intellect, or man, especially a prophet. Even a cursory familiarity with Scripture would indicate that most of the miracles recorded therein appear to be performed by either God or prophet. But we now learn that this is only appearance. Despite many Biblical testimonies and Rabbinic aggadot to the contrary, God cannot be the agent of miracles, and this is so for the following reasons. First, the very nature of a miracle precludes God from being its direct cause. A miracle is an infrequent and particular event that occurs in the terrestrial domain. If God were the proximate cause of such an event, this would mean that He is inferior in status to the Agent Intellect, whose activity in the earthly domain is continuous and general. In this sense, the occurrence of a miracle would be analogous to an accident, which is opposed to the essence, or nature, of some natural process or substance. Since the essential is for an Aristotelian always more important than the accidental, the cause of the former is superior to the cause of the latter. And since it has already been established that the Agent Intellect is the agent directly responsible for the order and plan of the terrestrial domain [i.e., its essence], the hypothesis that God is the agent of miracles would make God the cause of the accidental, and hence an inferior agent than the Agent Intellect. Second, we have already indicated that in Scripture miracles are frequently associated, in some manner, with a prophet. Gersonides has argued in Book 2 that it is the Agent Intellect that is the direct agent of prophetic communications. Gersonides also believes that the prophet plays an important role in miracles; e.g., he often announces, or forecasts, the occurrence of a miracle. Now if God were the direct cause of miracles, the prophet would not know anything about the occurrence of a miracle, since his information derives directly from the Agent Intellect. The prophet would then become entirely superfluous in the occurrence of miracles and the miracle could not be predicted.

This last remark should not, however, be construed as implying that the prophet is the direct cause of a miracle. For no man, even a prophet, has the requisite knowledge of nature for the performance of a miracle. After all, if Moses knows enough about snakes and wood such that he can change the latter into the former and conversely, why can't he change the color of his hand from pink to white and conversely *any time he wishes*? But he can't! Scripture itself suggests definite limitations to the power of man, even prophets, in the situations wherein miracles are

said to have occurred. The prophet is himself often described as being amazed by the miracle. Sometimes he is completely unaware of what is actually going on, acting as if he were a mere by-stander. Clearly then the prophet cannot himself be the cause of the miracle, although he may be the vehicle, or instrument of transmission, of the miracle.

-414-

By elimination we have therefore established the identity of the agent of miracle: it is our old friend again, the Agent Intellect. But this should not have occasioned any surprise. After all, the Agent Intellect is the agent of generation in the earthly domain, as we have learned in Book 5, and miracles, we shall see, occur only in this domain. Moreover, the Agent Intellect is the direct cause of prophecy, and prophets are the instruments, if not the agents, of miracles. The Agent Intellect is also the bestower of providence upon Earth, as we have learned from Book 4, and miracles are expressions of providential activity. It would then seem to be most natural and economical to have the Agent Intellect perform miracles. But in reaching this somewhat radical conclusion Gersonides does not mean that God has nothing at all to do with miracles. After all, God is the *ultimate* agent of the whole universe, including the earthly domain, and miracles occur within the plan of the latter domain, which plan is grounded in God's mind. Moreover, the Agent Intellect is derived from God via the movers of the spheres, so that the influence of the former is grounded in God's plan for the entire universe. We must remember that for the medieval mind, as well as the man of the Bible, everything was somehow seen as an expression of divine will or activity. Nevertheless, within the general framework of divine causality it is necessary to distinguish levels of causal efficacy. Sometimes God is the direct, or proximate, cause of some event, for example creation. Here, Gersonides insists, God acts without any intermediary agent assisting Him. Sometimes, however, He is only the indirect, or remote, cause of an event, and for Gersonides miracles are examples of God's indirect activity. The Agent Intellect is then the proximate cause of miracles.

Now that we have defined the nature of miracles and identified their agent, let us next examine *the domain* in which they occur and *how* they occur. For this purpose we shall consider several examples that illustrate Gersonides' principles. Perhaps Gersonides' most striking, indeed, radical, explanation of a miracle is his account of the story of Joshua and the battle at Gibeon. The biblical story of this event would appear to describe a miracle in the celestial domain, indeed an event of literally cosmic scope and significance. But this is not so -- nothing at all unusual happened in the skies that day! The miracle that occurred took place here on Earth, in the domain of human affairs. For the miracle consisted in the quickness of the victory of the Israelites over their enemy, not in the cessation of the sun's movements. But what about the passage, "and the sun stood still.... and the sun stayed in the midst of heaven and hastened not to go down about a whole day"? ⁵In interpreting these verses Gersonides

⁵Joshua 10:13-15.

-415-

is most ingenious. The ancient Israelites were not astronomers nor wellinformed about astronomical matters. In particular, they were unaware that at about a half-hour before noon, when this battle began, the sun *normally appears* to slow down and to remain stationary at its highest point in the horizon -- "the midst of heaven", and *appears* to hang suspended for about an hour until the period of its most intense light and heat is consummated. At that point, about a half-hour after noon it "begins" to descend and its heat and light gradually diminish. What Joshua asked from God is that the battle be completed during the period when the day is most

clear and bright, i.e., at "high noon". And this request was granted not by changing the natural courses of the sun and moon but by causing the Israelites to be victorious within a very short period of time. Thus, the Aristotelian principle that the heavenly domain is immutable is preserved.⁶ Moreover, if the miracle had consisted in some change in the natural behavior of the sun and moon, what benefit would have accrued to the Israelites or anyone else? Remember a miracle must have some beneficial purpose. If the miracle had involved the sun's halting, this itself would not have brought about the victory; indeed, the latter could have been accomplished without it. Nor did the Israelites or any other people either believe in God more firmly or acquire such belief because of the miracle at Gibeon. For Scripture usually records explicitly such changes in religious belief in the sight of miracles, as for example at the crossing of Sea of Reeds. Finally, if the sun and the moon halted, catastrophic events (e.g., tidal waves) would have occurred here on earth. So who would have benefited? Yes, there was a miracle performed for the Israelites on that day; but it did not take place in the heavens.

If one of the more striking miracles described in the Bible turns out to have *not* been a change in nature at all, what about the miracles performed through Moses, such as the Mannah raining from heaven and the parting of the Sea of Reeds? They seem to be clear-cut deviations from "natural possibility". How does Gersonides explain them?⁷ The first thing to note, Gersonides tells us, about the Mannah is that it is indeed unusual: nothing like it has ever happened either before or since. In the ordinary course of nature clouds are formed in the sky when vapors from the earth ascend and collect in the air not too far above the earth.

⁶Abravanel sharply criticized this explanation (I. Abravanel, *Mif alot' Elohim, Book 10, chapter 9; Commentary on Joshua 1, ad locum*). S. Feldman, 'Sun Stand Still' -- A Philosophical-Astronomical Midrash", *Proceedings of the Ninth World Congress of Jewish Studies, (Jerusalem, 1986), 77-84.*

⁷In the discussion that follows I shall also use material from Gersonides' Biblical commentaries, in which miracles are discussed in detail.

From such vapors the usual precipitation is water in some form or another; bread or any other solid food does not normally or even occasionally descend earthward. Yet such an event is logically possible; after all, the concept of bread falling from the sky isn't contradictory, although within the context of what is natural it would be highly improbable. Here Gersonides explicitly makes the crucial distinction between what is logically impossible and what is naturally impossible. It is logically possible, although naturally improbable, that at that time the elements combined so as to produce in the sky something like bread, which then descended. The second thing to note is that the bread, or Mannah, did not come from nothing: it was produced out of some kind of material, although the presence of that material at that place and time was indeed unusual.⁸ This latter point is also relevant to the explanation of the parting of the Sea of Reeds. We must note how Scripture describes the occurrence of that miracle. It explicitly indicates that a "strong east wind" blew all night, causing the Sea to dry up and divide. Gersonides insists that we attend to the fact that these miraculous events are effected by natural means, although their agent is supernatural. Indeed, he stresses, these natural means are the most appropriate to the phenomenon which is to occur. Only fools think that miracles occur by means of strange or unnatural means.⁹

Gersonides' attempt to "naturalize" or "rationalize" the miraculous was not the first in the history of Jewish religious thought. Even amongst the Rabbis there is evidence of some reluctance

concerning the intrusion of miracles. There are two classic passages in which this sentiment is expressed:

"Ten things were created on the eve of the Sabbath at twilight, and they are: the mouth of the earth, the mouth of the well, the mouth of the donkey the manna, the rod....." [Mishnah Avot 5:6].

"The Holy One, blessed be He, made a condition with the sea, [i.e.,] that it would divide before Israel... Rabbi Jeremiah...said: The Holy One, blessed be He, has made conditions not only to the sea but to all that has been created in the six days of the Beginning" [Genesis Rabbah, V:5].

To Maimonides these passages suggested that the Rabbis had recognized that if miracles were *ad hoc* violations of the laws of nature, they would introduce change in God, and this was of course unacceptable. So he seems to have endorsed this Rabbinic idea of a pre-arranged plan of

⁸Gersonides, *Commentary on the Torah*, Exodus, 70d.

⁹Gersonides, *Commentary on the Torah*, Genesis, 20d; *Commentary on Exodus*, 686-690.

miracles: all miracles are "built into" the laws of nature at the very beginning of the world. [10](#)

How did Gersonides react to this theory of miracles? *Prima facie* it would seem that he should subscribe to it as well; for he too does not want to attribute any change to God. In the early part of Chapter 10, Gersonides makes the following observations concerning this theory. First, it clearly rules out the view that man, particularly a prophet, is the direct agent of miracles. For if the miracle is pre-ordained, the fact that Moses threw his staff on the ground shows that Moses was merely an instrument, not the actual cause of it. Second, this theory does not account for all miracles. For example, it doesn't apply to those miracles that are requested by a prophet (e.g., Elijah) or by some other worthy man (e.g., Gideon); for if it did, such miracles would have occurred without the request having to be made. Indeed, the prophet, even as a mere instrument, would be otiose. Third, and most important, if such events were in some way entirely preordained, free-will would be annulled. For example, if the crossing of the Sea of Reeds was part of the divine plan of the universe, as some of the Rabbis suggest, then Pharaoh had no choice in being obstinate and in pursuing the Israelites after he had finally relented and let them go. How then could Pharaoh have been rightly punished? [11](#) Here we have an extension of the problem of divine foreknowledge and human freedom which was discussed in Book 3, where we saw that Gersonides was insistent upon the primacy of human freewill. Whatever theory of miracles is to be adopted, it must be understood in such a way that genuine contingencies and human freedom are preserved. Gersonides now proceeds to interpret these rabbinic passages in a manner that is consistent with his general philosophy.

He concedes initially this underlying idea of these texts: miracles are in some way implicit in the general plan of the universe; otherwise their occurrence would constitute *inexplicable* deviations from the divine wisdom according to which the universe was created. Such deviations would mean that *new* volitions or desires accrued to either God or the Agent Intellect at the time of their occurrence, a hypothesis that is to be rejected since God and the Agent Intellect are immutable. Now if we look closely at the language of the Rabbis in the passage in Avot 5:6, we shall find a way out of this apparent dilemma. Note the phrase: "Ten things were created *on the eve of the Sabbath* at twilight..." This means that they were "inserted into the plan" just before God ceased from further creative activity. According to Gersonides this implies that these miracles

¹⁰Maimonides, *Guide*, II:29; *Commentary on Avot 5:6; Eight Chapters*, VIII.

¹¹Gersonides discusses this topic in detail in his *Commentary on I Kings*, chap. 22, 24th lesson. See also his *Commentary on Me Torah*, Exodus, Parshat Beshalaḥ, 68d-69a.

-418-

exhibit two aspects: in so far as they were created *before* the Sabbath they were part of the first six phases of creation, which is, Gersonides stresses, a voluntary act of God. But in so far as they were created at twilight they share the naturalness and orderliness typical of the world *after* the initial creation has already been completed; in this sense they are *ordered and fixed*. Accordingly, no change either in God or in the Agent Intellect took place when the earth opened up and swallowed Korah and his cohorts. Gersonides' analysis of these miracles implies that the occurrence of such a miracle is not completely necessitated. It was always open to Korah not to have challenged Moses and Aaron. Just as a man's free will can subvert the astral determinism of the heavenly bodies, so too this freedom can avoid the "semi-determinism" of the original plan of creation. For in both cases the plan is general and hypothetical: it asserts that *if* there are men of a *certain type*, under certain conditions the earth will open up and swallow them. If there are in fact no men of that type in these conditions, this law is not falsified; it is just not instantiated. Accordingly, for Gersonides creation involved two orders, or plans: (1) the natural, or "normal", order of everyday phenomena (e.g., rain in the winter); and (2) the order of miracles, which are "written-in" as it were in the first plan but in a hypothetical mode. Both plans assure a certain regularity in nature and human history; but they do not preclude deviations deriving from human freedom. Just as divine omniscience is general and hypothetical, so is divine omnipotence. God indeed knows that most people would not sacrifice their only child, especially one born to them in old age; but once in a while there is someone who will choose to do so if God commands. Similarly, God is always prepared to respond to the prayers of the prophets who intercede in behalf of their people; but the prophets have *to choose* to pray and the people had to have chosen their acts that brought about the situation wherein intercession was needed. On this latter point Gersonides is quite insistent:

".... the miracles that God performs through this prophet by means of prayer...as in the case of the prayers of Elijah concerning the son of the [widow of] Zarephath to revive him...[these] were not fixed at the time of creation such that they would occur when they did occur [necessarily], as some people have inferred from what the Rabbis have said: 'The Holy One made a condition....' For if this were the case,...the nature of the possible would be annulled... and the occurrence of these miracles would be by necessity..." [*Commentary on I Kings*, 22, 24th lesson].

Human freedom is then a paramount value for Gersonides.

Gersonides' interpretation of these rabbinic texts deviates from the Rabbis in another significant respect. According to the Rabbis, *God* is the agent of these miracles; indeed, in the Passover Haggadah we read: "I

-419-

(i.e., God) have passed through the Land of Egypt, not an angel!" We have already learned, however, that for Gersonides God is not the direct agent of any miracles. Although he can be considered to be the remote cause of miracles in so far as He has created the universe in such a way that these events may occur, God is not their proximate cause. Gersonides therefore interprets this passage from the Haggadah in a different manner. The angel referred to is any of the separate intellects that move the heavenly spheres. Such intellects, or angels, are excluded

from the domain of miracles because first they are the transmitters of general providence whereas miracles are the expressions of individual providence; and second, they have only partial, or fragmentary, knowledge of the terrestrial domain wherein miracles occur. In contrast to these "angels", the Agent Intellect is the transmitter of individual providence and prophecy, since it is the agent of generation in the sub-lunar world, the domain of human affairs. Thus, for Gersonides, this passage from the Haggadah is to be understood as contrasting the acts of God and the activities of the movers of the spheres.

In support of this interpretation Gersonides appeals to another rabbinic text: "God does nothing without consulting his divine ministers".¹² According to Gersonides, this dictum ought to be understood as follows. First, it refers to that which God performs *after* the six days of creation. Second, the phrase "divine ministers" in this passage refers to the Agent Intellect, who contains the plan for the sub-lunar domain *in toto*. Specific departures from this plan were indeed incorporated into this plan, as the Rabbis and Maimonides had suggested; but they are brought about by the Agent Intellect, who as the transmitter of prophecy also informs the prophet of their occurrence.¹³ It turns out then that Gersonides' account of miracles is a corollary of his general theory of necessity and contingency. In so far as nature and human action are rule-governed, natural and social phenomena are subject to causal laws, the origin of which lies in the very beginning of creation. But these laws are not so strict that they preclude "deviations", or "irregularities". Yet, these exceptions are part of the original game-plan and will eventuate *if* people act in certain ways. That they will so act is, however, a matter of their own choice. Thus, contingency is preserved.

¹²*B.T. Sanhedrin*, 38b.

¹³Maimonides' interpretation of this text from *Sanhedrin*, 38 b is similar to that of Gersonides, except that he does not give any special prominence to the Agent Intellect in the causation of miracles.

II

The second theological addendum concerns the problem, how are prophets tested? Suppose someone claims that he is a prophet and attempts to prove this claim by performing a miracle. Is the ability to perform a miracle sufficient to justify our belief in his claim to prophecy? Religious history and literature provide us with examples of individuals whose claims to prophecy have been supported by their performance of wonders. Yet in the Jewish philosophical tradition both Saadia and Maimonides had claimed that the performance of a miracle is not a decisive test for prophecy. Thus, if a man claims that he has been sent by God to command the Israelites to worship an idol, he should not be believed even if he causes Mt. Sinai to disappear; for he asks the Israelites to violate one of the divinely revealed commandments. The performance of a miracle is then not a sufficient condition for determining who is a genuine prophet.¹⁴

Now suppose a person performs a miracle and asks us not to violate any commandments of the Torah? He merely makes a prediction about what will happen at some future date and uses the miracle to convince us of his authenticity. Now the problem becomes more complicated, and further tests seem to be required. After all, the magicians of Pharaoh performed wonders too! How are we to proceed in this case? In the first place, Gersonides tells us, we should realize that although a prophet is not the agent of miracles, miracles do frequently occur through his instrumentality. Moreover, a prophet has the unique ability to predict the occurrence of a miracle. Since the Agent Intellect is the agent of miracles and the prophet receives his message

from the Agent Intellect, the prophet alone has the ability to announce the future occurrence of a miracle. Hence, if a person announces that there will be a plague of boils throughout Egypt on a certain day, and this plague does materialize on the predicted day, this fact strengthens the belief that this person is a prophet. We have then a test that serves to confirm a prophetic claim so long as the claim does not violate the Torah and is concerned with a prediction about a future miracle.

However, not all prophetic claims are either supported by or concerned with miracles; often they are merely predictions about special events. For example, suppose someone predicts that tomorrow I will find a book that I lost several weeks ago. If such a prediction turns out to be true, we would ordinarily chalk it up to luck. But if predictions of this

¹⁴Saadia Gaon, *Book of Beliefs and Opinions*, Treatise III, chapter 8. Maimonides, *Mishneh Torah, Hilkhoh Yesodei Hatorah, chap. 10*.

-421-

type were consistently made and verified, then we would come to believe that the forecaster had some special, extraordinary power. This was the case with Samuel. Scripture tells us that he consistently made true predictions, and the people therefore believed in him. Thus, continued success in predicting events is also a relevant test. But are all kinds of events equally relevant to such a test? Does it matter whether the prediction is of an event that is beneficial or that is harmful? The Prophet Jeremiah claimed against his opponent the prophet Hananiah that the latter claim of the imminent return of the Judeans from the first Babylonian exile would be sufficient to demonstrate who is the genuine prophet, Jeremiah or Hananiah. For whereas the prediction of a disaster is not sufficient for this purpose, since God would always relent if man changes his ways, the prediction of good tidings seems to be an adequate test for determining a genuine prophecy, given God's goodness. ¹⁵Hananiah himself then has really "laid it on the line" with his favorable forecast. We have here, it seems, a test that is sufficient to determine the true prophet, regardless whether he performs a miracle.

But to Gersonides Jeremiah's test raises certain problems. First, it would appear that if Hananiah's favorable forecast had turned out to be true, the event predicted would have been inevitable and genuine contingency would have been eliminated. Again we see Gersonides' desire to retain some contingency in the world. Second, is it really the case that *all* divine promises of good fortune are fulfilled? Consider the case of Jacob: God had promised him that He would be with him wherever he would go; yet Jacob was subsequently afraid of Esau. ¹⁶It would seem that Jacob at least was not convinced that a promise of good fortune is always fulfilled.

To these questions Gersonides replies first, that prophetic predictions in general do not subvert or limit human freedom. Human freedom would be annulled only if a prophet were to predict an evil tiding for the nation such that no matter what the nation would do, the catastrophe could not be averted. This the prophets do not do. All their evil forebodings are conditional: if the people repent, the evil event will not take place. Accordingly, human freedom is preserved. Second, in the case of a beneficial prophecy, we have to determine what kind of providence is behind the occurrence of this piece of good fortune that is believed to be unconditional and hence can serve as a test for prophecy. If the prediction is based upon the prophet's knowledge of the workings of *general* providence, which is effected by the heavenly bodies and their movers,

¹⁵Jeremiah, 28.

¹⁶Genesis, 28:15, and 32:8.

then such predictions are unconditional and can be used to test the prophet. For in this case the predicted good tiding is inevitable, given the providential character of the workings of the heavenly bodies. Thus, if a person claims to be a prophet and predicts a good harvest next year, we should wait and see. If the harvest is good, then his claim has been supported although not proven, since diviners and astrologers, too, can make such predictions. But if this person's predictions are consistently verified, then his claim to prophecy is confirmed, for diviners make errors.

However, we have already learned from Book 4 that there is another kind of providence -- individual providence; this type of benefit derives from God via the Agent Intellect and is often communicated to man through prophets. Gersonides claims that a prediction of a benefit deriving from individual providence may not be realized; for such goods can also be conditional. Although Jacob was promised by God that he would be with Him -- an obvious case of individual providence -- nevertheless, Jacob was afraid of Esau because he was worried that he might commit some sin and hence be responsible for the non-applicability of the promise of divine protection, which is thus conditional and revocable. Jacob's fear of Esau is then not inconsistent with Jeremiah's view that a genuine promise of beneficence should be realized, if these goods are part of general providence. If Hananiah's prediction is falsified, it is clear that he was not speaking the word of God. On the other hand, God's prediction to Jacob was an instance of individual providence, which is conditional and revocable. Thus, Jacob was understandably afraid of Esau. ¹⁷

There is, however, a Rabbinic dictum that seems to be contrary to Gersonides' thesis. The Rabbis claim that a divine blessing is irrevocable *even if it is conditional*. Thus, Jacob ought not to have been afraid. In support of this claim the Rabbis cited the passage wherein God says to Moses that He will destroy Israel because of its sins and make a new nation from the seed of Moses. ¹⁸ The Rabbis interpreted this passage as implying a curse upon Israel and blessing for Moses. However, Moses prayed for the cancellation of this curse, and his prayer was granted; moreover, the blessing was granted to *him*. Thus, the Rabbis argued, we seem to have here a condition -- i.e., Moses was not to intercede -- that was not satisfied; yet the blessing was still fulfilled! ¹⁹ Gersonides as usual accepts the Rabbinic dictum on one level but interprets it so that his own views are preserved. What is the nature of the condition involved in this promise to Moses? It is not, as it may appear, that Moses would for-

¹⁷Gersonides, *Commentary on the Torah, Genesis*, 40d-41a, 41d-42a.

¹⁸Exodus, 32:10.

¹⁹*B.T. Berachot*, 7a.

felt his blessing if he were to intercede for Israel. For it would have been a serious sin not to have prayed on Israel's behalf, as we learn from Samuel, who said: "Far be it from me that I should sin against the Lord in ceasing to pray for you." ²⁰ This means that God's promise to Moses cannot be interpreted as a blessing that is essentially conditioned upon his not interceding for the children of Israel. For how could a blessing be earned by sin? Rather, when God said to Moses that he should not intercede on their behalf, He meant that Moses should not go overboard in his efforts nor worry too much about their future; for a nation will come forth from him. This

passage is not to be construed then as a strong, or essential, conditional: if you do A, then necessarily B; if you do not do A, necessarily not B. This was the situation in Jacob's case, and that is why he was worried. But in Moses' case the condition was non-essential, or weak. Indeed, it was hardly a condition at all.

Has then Gersonides provided us with a complete and decisive procedure for testing a claim to prophecy? At the outset two absolutely necessary conditions have to be satisfied: the claimant has (a) to have attained a very high level of intellectual and moral perfection, and (b) must be loyal to the Torah, although he may temporarily annul a particular commandment in a time of need, except for the prohibition against idolatry. Now since prophets (except for Moses, the giver of the Torah) are, for Gersonides, primarily forecasters, several conditions are attached to this talent. If the prediction is for a benefit deriving from general providence, the benefit will be realized; but the prediction of it won't be enough to distinguish the claimant to prophecy from the diviner. On the other hand, if the benefit is supposed to derive from individual providence, the knowledge of which the diviner lacks, then if the benefit is not realized, it will be necessary to determine whether the benefit was essentially conditional upon some factor (e.g., Jacob's obedience). For if it is, then the non-occurrence of benefit will not be sufficient to falsify the claimant. If, however, the condition is non-essential (e.g., Moses' intercession), the benefit must eventuate. Thus, if the claimant makes this kind of prediction but it does not turn out as he predicted, the person is a *false prophet*. Finally, if the claimant announces that he or she will be the instrument of a miracle or that a miracle will occur in connection with some prediction that he or she will make, then, if the miracle does occur, the claimant has been authenticated. For this is, Gersonides claims, a unique feature of the prophet. ²¹

²⁰I Samuel, 12:23.

²¹Saadia Gaon, *Book of Beliefs and Opinions*, III: 4 - 5.

Now it would appear that the latter two conditions are the more telling tests. Let the person predict a non-essentially conditional benefit of individual providence or announce a miracle; then we shall see whether "the spirit of the Lord is in him". Unfortunately, these two tests are *not* decisive, either singly or jointly. For why should the sage be prevented from being able to predict a good that is non-essentially conditional? And why couldn't he announce a forthcoming miracle? Why does this ability uniquely belong to a prophet? Since the sage can equal or even excel the prophet in theoretical knowledge, there doesn't seem to be a sufficient reason for distinguishing between the two in this context. Since Gersonides concedes that sages can be the instruments of miracles, why can't they announce them? When Honi ha-me'aggel or Rabbi Hanina ben Dosa made the rain fall, couldn't they have predicted it? ²² Indeed, didn't they? It is precisely the prediction of the miracle that gives credence to the claim, when the miracle does occur, that the predictor is either the instrument of the miracle or intimately associated with it. Gersonides rightly sees this connection, but he arbitrarily restricts it to the prophet. Perhaps he should have given more attention to the rabbinic maxim: "the sage is more authoritative [*adif*] than the prophet". ²³ Finally, not all prophets are associated with miracles. Neither Amos nor Micah performed or announced any; and Jeremiah wisely refrained from doing so in his conflict with Hananiah. So the most practical and apparently decisive test provided by Gersonides turns out to be insufficient. Hence, it is difficult to avoid the conclusion that Gersonides has failed to formulate a complete and decisive test-procedure for prophecy. ²⁴

²²*B.T. Ta'anit*, 23a, 25a; *Berakhot*, 33. Josephus, *Antiquities*, XIV:2.1.

²³B.T. Bava Batra, [12](#) a.

²⁴C. Touati, *La Pensée*, [461](#) - [66](#).

BOOK SIX

Part 2

CHAPTER I

The thesis of absolute creation ex nihilo is not entailed by the words of the Torah and Prophets.

CHAPTER II

The multiple meaning in Hebrew of the phrase 'beginning of' [reshit]

CHAPTER III

The various meanings of the word 'earth' ['eretz]

CHAPTER IV

The meaning of the phrase 'void and emptiness' [tohu va-bohu]

CHAPTER V

The multiple meanings of the terms 'light' ['or] and 'darkness' [ḥoshekh]

CHAPTER VI

The various meanings of the term 'spirit' [ruaḥ]

CHAPTER VII

The meanings of the terms 'firmament' [raqi'a], 'the lower waters' [ha-mayyim ha-tahtonim] and 'the upper waters' [ha-mayyim ha-'elyonim]

CHAPTER VIII

The teachings of the Torah on the topic of creation

CHAPTER IX

The basic principles of the concept of miracles.

CHAPTER X

The agent of miracles and how they are accomplished by this agent.

CHAPTER XI

That the performance of miracles is possible by means of a wise man who is not a prophet.

CHAPTER XII

The things with respect to which miracles are possible or impossible; how miracles can come about.

CHAPTER XIII

How the prophet can be tested.

CHAPTER XIV

The solution of various difficulties pertaining to the questions of miracles and prophecy that arise because of some stories in the prophetic books.

-427-

CHAPTER I

IT is quite clear that religious principles do not imply the belief in creation *ex nihilo*. Indeed, we find that all [the examples] of miracles are [generations] of something from something; as, for example, the generation of blood from water, the generation of flies from dust, the generation of the snake from Moses' staff. Analogously, the swallowing of all the other staffs by Aaron's staff is not a [case] of destruction into nothingness. For ^a it is the snake that swallows up the other snakes; unless one wants to call the transformation of food into the very substance of the organism "destruction into nothingness". ¹ Similarly, the miracle of the oil brought about by Elisha ² does not entail the [belief in] creation *ex nihilo*. For, according to us, this was like the transformation of the staff into a snake: when the woman emptied the pitcher, the air entering the vessel was transformed into oil. ³ In general, the Torah is not an imposed law that forces us to believe false doctrines and to perform useless actions, as the masses believe. Rather, it is the most perfect law, as has been explained in our *Commentary on the Torah*. Indeed, its perfection leads men to want to live according to this perfect law, and this is the definition of a perfect law, as Aristotle has pointed out. ⁴ Accordingly, there is obviously nothing in the Torah that would lead us to believe something false; for whatever is false does not itself induce belief in and adherence ^b to it. Hence, it is necessary that we posit what the Torah teaches in such a way that it is in agreement with philosophical inquiry. For this reason Maimonides interpreted anything in the Torah that suggested the corpo-

¹That is, just as the first set of miracles show that creation proceeds from some preexisting material, so too the latter miracles show that destruction is not annihilation into sheer nothingness.

²II Kings 4: 1-7.

³cf. Gersonides' Commentary on II Kings 4: 1-7.

⁴I have not found an exact source for this reference to Aristotle. Touati suggests Aristotle's *Rhetoric I*: 14, 1375a 15ff, where Aristotle contrasts the unwritten universal natural law with the written, conventional laws of particular societies [Touati, *La Pensée*, 480, n. 18. Staub refers to *Rhetoric I*: 15, 1375a 22 ff, J. Staub *The Creation of the Word According to Gersonides*, (Chico, 1982), p. 168, n. 17]. Whereas the latter coerce their followers, the former does not. The better person will follow the natural law, even though this law does not coerce (1375 b 6-7). However, this passage does not exactly correspond to Gersonides' point. For he is concerned with contrasting the divinely revealed Torah with ordinary conventional laws. Perhaps he is unconsciously equating the divine law with natural law, as Philo consciously did in his *On the Creation of the World According to Moses*, 1.

-428-

reality of God in such a way that it did not contradict the teachings of reason. Similarly, he said that if philosophy could prove the eternity of the universe, he would be obliged to interpret those passages in the Torah that seem to differ from this doctrine in such a way as to be in agreement with reason. ⁵

It should be realized from what has been mentioned in the Torah concerning the creation of the world that the opposite has in fact happened to us; i.e., we need not force ourselves to explain the Torah with respect to this topic, [i.e., creation], in such a way as to be in agreement with reason. Rather, what the Torah teaches on this topic has in some sense been a cause of our having arrived at the truth on this issue by rational means. For ^c what has actually stimulated us to find the truth on this topic was that which was indicated to us explicitly in the Torah about creation. [Indeed,] that which the Torah records about this subject is especially helpful to the inquirer in his search for the truth on this question, as we have pointed out in our Commentary on the chapter dealing with creation. And this is what we should expect of the Torah. Since the Torah is a law by means of which man attains his ultimate perfection, as we have explained in our *Commentary to the Torah*, it is necessary that the Torah lead men to the attainment of the truth on those topics that are especially obscure and difficult. For when the truth concerning these questions is revealed by tradition and in addition [our] knowledge is guided ^d in some way by matters that lead man to the truth on this topic, then much of the difficulty in the attainment [of the truth] on these questions will be removed.

However, before we begin to explain the account of creation given in the Torah, we wanted to point out that the miracles recorded [in the Torah] do not imply that the world is created *ex nihilo*, since it was this point that compelled Maimonides to believe in creation, as he himself admitted. For [according to Maimonides] if we were not required to believe in miracles, it would be easy to interpret the passages in the Bible that suggest creation in such a way so as to agree with Aristotle's [theory of eternity of the universe]. ⁶ However, how miracles can occur, who is their agent, the domain of their occurrence, and their purposes, [are questions] that we shall examine after we have completed our explanation of the Biblical account of creation. ⁷

⁵Maimonides, *Guide*, II: 25.

⁶Ibid.

⁷The discussion in chapters 2-8 should be compared with his exegesis of these topics in his *Commentary on the Torah*, Genesis, 9-13.

CHAPTER II

IT is necessary that we explain the terms that the Torah uses in its discussion of creation before we explain the account [of creation itself], for the understanding of the terms [*dibbur pashut*] necessarily precedes the understanding of the sentences [*dibbur murkav*]. ¹

The term "beginning" (*reshit*) means in Hebrew that part of a thing which is prior to all its other parts, no matter what kind of priority. ² Either priority in time, as it is said, "In ^a the beginning of the kingdom of Jehoiachim", ³ i.e., in the first portion of the time in which Jehoiachim reigned. Similarly, "of the first of your dough", i.e., the part of the dough that they offer as a sacrifice first. ⁴ And, "the first of the fleece of thy sheep", ⁵ and many others. Or, there is priority in order, as it is said, "they shall not exchange nor alienate the first portion of the land, for it is holy unto the Lord"; ⁶ i.e., the first part of the land with respect to order, which was one of the portions [of the land] that was previously listed. The following passage perhaps has this connotation too: "And the beginning of his kingdom was Babel." ⁷ Similarly, "the beginning of wisdom is the fear of the Lord", ⁸ for the fear of God is wisdom, as it is said, "the fear of the Lord is wisdom". ⁹ Thus, it is said that the first part of wisdom is that wisdom by means of which man is led to the fear of God, i.e., political philosophy; for moral perfection necessarily precedes in order intellectual perfection. ¹⁰ This point needs no further explanation for the reader of

¹I have translated *dibbur pashut* ("simple speech") and *dibbur murkav* ("compound speech") as "terms" and "sentences". According to Aristotle a sentence, or judgment, involves a "composition" of subject and predicate. A term, however, is simple in so far as it makes no predication (Aristotle, *On the Soul, III*: 6; *Categories*, 2, 1a 17).

¹⁰Perfection of the moral virtues precedes in order the perfection of the intellect in the sense that the latter cannot be acquired by an immoral man. (Maimonides, "Guide, III": 54).

²In *Metaphysics, V*: 1 and in *Categories*, 12, Aristotle distinguishes various senses of the term "ἀρχή", "beginning". Although Gersonides' analysis is based upon Aristotle's account, it is not an exact reproduction of it.

³Jeremiah, 27:1.

⁴Numbers, 15:20.

⁵Deuteronomy, 18:4.

⁶Ezekiel, 48:14.

⁷Genesis, 10:10.

⁸Psalms, 111:10.

⁹Proverbs, 1:7.

-430-

this treatise. Or there is priority in rank, as it is said, "[Israel] is the Lord's hallowed portion, His first-fruits of the increase"; ¹¹i.e., this part of the species is set aside for the service of God more than any other part of the species. This priority is one of rank. Or there is the priority of causality and nature, ¹²as it is said, "The Lord made me as the beginning of His way"; ¹³i.e., the conceived order [in the mind of the agent] is prior to the activity resulting from it with respect to causality and nature. It is this latter sense [of "priority"] that is implied in the sentence, "In the beginning God created", ¹⁴as will be explained later.

¹¹Jeremiah, 2:3.

¹²Wolfson, *Crescas Critique*, 481-82. A causal sequence was regarded by the medivals as a natural order (Aristotle, *Categories*, 12).

¹³The manuscripts have



Leipzig reads



Neither reading is correct. The biblical text is:



¹⁴Genesis, 1:1

-431-

CHAPTER III

THE term "earth" [*eretz*] is equivocal. It is frequently predicated in a narrow sense of the earthly element. But it is also predicated in a wider sense of all the [terrestrial] elements; indeed ^a, this is so since the earthly element is in the lowest place [of the sub-lunar world] and the elements in their entirety are below the heavens. This [latter use] is indeed ^b frequently [the meaning] when it occurs with the term "the heavens", as in such sentences as: "What God is there in heaven or on earth that can do according to Thy works," ¹or, "In the beginning God created the heavens and

the earth". ²This is found frequently. This is [also] the connotation when it is said, "The earth was unformed and void." ³The term "earth" in this sentence refers to the earth in the previous sentence [i.e., to all the elements, whereas in verse ten the earth proper is referred to]. ⁴

¹Deuteronomy, 3:24.

²Genesis 1:2.

³Ibid, 1:2.

⁴This interpretation of the term 'eretz is taken from Maimonides (*Guide II:30*). The commentaries of Nachmanides and Abravanel should also be consulted.

CHAPTER IV

THE terms *tohu* and *bohu* in Hebrew connote the remote matter of an existent and its final form, which is prior in order. ¹Note that the

¹The Hebrew phrase *tohu va-bohu* has been the subject of many diverse explanations and translations ever since the Bible began to be interpreted and translated. The Septuagint rendered it as "invisible and unadorned" i.e., empty.

Gersonides explains these terms within the framework of Aristotle's natural philosophy, as it came to be interpreted throughout more than a millennium of continuous exegesis (H. Wolfson, *Crescas' Critique of Aristotle*, chap. 5 and notes). In this chapter, however, Gersonides' definitions of these terms is confusing because (1) he inverts the order of the definitions, and (2) he changes the terminology. Although *tohu* is the first term in this phrase, Gersonides defines it second in order as *ha-tzurah ha-'abaronah*, "the final form"; whereas *bohu* is defined first as *ha-homer ha-rahoq*, "the remote matter". A couple of sentences later he will identify *bohu* as the "first matter" (*ha-homer ha-rishon*) and *tohu* as "the form first in order" (*ha-tzurah ha-rishonah beseder*). Then a few sentences afterwards he shifts back to *ha-tzurah ha-'haronah*, "the final form".

Perhaps we can get a grip on these terminological shifts if we try to understand the philosophical concepts behind the terms. "Primary matter" and "remote matter" are equivalent renditions of the Aristotelian idea of the basic material substratum underlying all physical changes and transformations. This fundamentum is intrinsically formless; but for Aristotle, it doesn't actually exist as such without form, since it is always informed by some definite form. Because we never perceive this matter as formless, as the universal substratum underlying all change, it is *remote* from us, albeit first in the scale of the development of matter. The more specific the matter is, the more proximate it is to our experience (Maimonides, *Treatise on Logic*, chap.9. Abraham ibn David, *Emunah Ramah*, I:2). We only get to this remote, or first, matter by philosophical analysis; it is for Aristotle a "theoretical construct", a concept he needs for his physical theory. Gersonides equates it with the Biblical term *bohu*, the initial matrix of material change.

Gersonides' interpretation of the term *tohu* is more complicated, indeed confusing, since he alternately calls it "final" and "first" form. But here too we are again faced with the most "primitive" level of form in nature, just as before we had the most elementary stage of matter. Just as the latter is "remote", so is the former. In this sense we can consider this primitive level of form to be "last", even though in another sense it is first. Aristotle too recognizes this

apparent paradox in two passages where he speaks of matter and form at their most elementary levels as



τὰ ἔσχατα

"the farthest", "the last" [*Metaphysics*, VIII: 6, 1045b17; XII: 3. 1069635]. The term



"ἔσχατος"

also has the connotation of *lowest, least*. (Thus, Touati translates Gersonides' "final form" as "*la forme la plus basse*". *La Pensée*, 271).

Both in this chapter and in his Commentary on the Torah Gersonides supplies some additional information on this mysterious "final form that is first in order". He tells us that this form is "the form of the elements", or "the elemental forms". A few sentences later in this chapter, Gersonides will say of this final form that it is "the elemental forms" by means of which the primary matter is capable of receiving, or taking on, all other forms (he makes the same point in chapter 8). There are two passages in the Commentary on the Torah that are worth citing here:

".... the final, [or last], form is the form which is received by the first matter initially before it receives the other forms; i.e., [it is] the elemental forms." [9c]

"When God first created the heavens and the earth.... and created in the lower world its basic principles, i.e., the first matter and the first material form, i.e., the elemental form, which is received by the first matter...." [10a]

Now these elemental forms are the basic elements of fire, air, water, and earth, which are themselves the product of the primary pairs of qualities: hot/dry, hot/moist, cold/moist, cold/dry. These are the "formal building blocks": all other material forms are "composites" of these elements, or of their primary qualities. Like first matter, final form is "remote" from our experience. Although we are familiar with fire, air, water, and earth, we do not normally encounter them in their pristine forms, i.e., as pure elements. We usually perceive compounds of them.

*A word of caution: Gersonides' "final", or "last", form is not to be confused with Maimonides' use of this term in Guide I:69, where the "Rav Ha-moreh" identifies God as "the final form" (Pines' translates the phrase as "the ultimate form"). Obviously, Gersonides has something else in mind in his use of this term. God is for him always "first form", the most superior stage in the scale of forms (*The Wars of the Lord*, Bk. 5, pt. 3, chap. 12; *Commentary on Song of Songs*, 9b). In our present context we are concerned with the lowest level of form [See also Gersonides' *Commentary on the Torah*, 194a, where he explicitly says that the lowest level of form is "the last form, i.e., the form of the elements" and the highest, or first, form is God. For different interpretations of this concept see J. Staub, *The Creation of the World According to Gersonides*, 183-213 and G. Freudenthal, "Cosmogonie et Physique chez Gersonide", *Revue des Etudes Juives*, 145 (1986), 302-03.*

Torah says metaphorically ^a, "And He shall measure it with a line of chaos and with weights of emptiness." ² This is the dwelling-place of those animals which are referred to as [possessing] the destroyed place. That is, they [i.e., these animals] will dwell there so that they will prepare that place for themselves; as if they were to stretch out for themselves the first matter and the form that is first in order ^b ³ for the building they need there; these are the elements and

foundations of a thing. An example of this is as follows: someone who wants to build a house must first make a diagram [i.e., the form] of the lowest level of the house [indicating] the size and the shape desired (e.g., square or circular); then he brings the stones [i.e., the matter] that are to be the foundations and pillars of the walls. Now the Torah assigns the form to the word "*tohu*" -- this is the line that is first stretched over the building; whereas it assigns the matter the term "*bohu*" -- these are the stones, for matter is the substratum for the form, i.e., the form is *in it* [*bo*]. This interpretation of the term "*bohu*" has already been given by Rabbi Abraham bar Hiyya in his book *The Form of the Earth*.⁴ Now the form is mentioned before the matter

²Isaiah, 34:11, *tohu* -- "chaos"; *bohu* -- "emptiness".

³*ha-tzurah ha-rishonah beseder*. (The printed editions have: *ha-tzurah ha-aharonah*). This is the troubling phrase mentioned in note 1. Final, or last, form is "first in order".

⁴I have not been able to locate this reference to bar Hiyya's *Tzurat Ha-arets*. Touati points out that in bar Hiyya's *Hegyon ha-Nefesh* just the reverse view is expressed: *tohu* is identified with matter and *bohu* is form (Abraham bar Hiyya, *Hegyon ha-Nefesh*, ed., G. Wigoder (Jerusalem, 1971), 42. Touati, *La Pensée*, 271 n. 12).

because the matter exists for the sake of the form. For this reason the Torah says: "The earth was unformed (*tohu*) and void (*bohu*)," i.e., [the earth consisted of] the final form and the first matter. And this ^c form is identical with the forms of the elements, by means of which the first matter is prepared to receive the other forms.

The interpretation of this passage [in Isaiah] by our Rabbis of blessed memory is especially striking. They say: "'*tohu*' [refers] to the green line that encompasses the universe; '*bohu*' [refers] to the slimy stones [that are sunk in the deep, out of which the waters proceed." ⁵ Now since these [various] forms are contraries and since the elements are elements of things by virtue of their mixing, and [the mixture] is itself the intermediary, ⁶ God took something here that is intermediary between the contraries, i.e., green. He took the intermediary in colors because it is the most well-known intermediary amongst contraries. ⁷ When the Rabbis said "*mefulamot*" they meant "*palmoni*", a term that connotes hiddenness and anonymity. Thus, the term is composed out of the words "*peloni*" and "*almoni*", terms that connote hiddenness and anonymity. ⁸ The reader of this book is familiar with the hiddenness of the prime matter and the imperfection that attaches to its conception because of this hiddenness. ⁹

⁵*B.T.Hagigah*, 12 a.

⁶Since the elements are contraries, they cannot exist together in actuality in the compound. The compound, then, must be intermediate between the extremes, i.e., the contraries (cf. Averroes, *Commentaries on Generatione and Corruptione*, p. 56 (Hebrew), p. 65 (English)).

⁷In his commentary on Genesis 1:2 Gersonides elucidates this argument. Firstly, generation is a process involving a change in a subject from one contrary state to another contrary state. Now if the two contraries are conceived as the extremes, or limits, of a continuum, the locus of the change is the mid-point (*ha-menititz'a* in this continuum. In temperature, for example, the mid-point would be that point in the scale on either side of which there is either heat or cold, such that the object is either hot or cold if it has a degree of temperature on either side of this mid-point. Secondly, the most common mid-point, according to Gersonides, amongst contrary states occurs within colors, and the color green is this mid-point (Aristotle uses the term



ὄχρος

"yellow", which can be rendered in Hebrew as *yaroq*, the standard term for "green"). This point is not especially clear. Perhaps he means that colors are obvious contrary qualities; and the color green can be regarded as the midpoint, since in the color spectrum, where the extremes are black and white, it occupies virtually the middle position. Thus, on either side of green we have either a dark or a light color (cf. Abravanel, *Commentary on Genesis*, ad locum. G. Vajda, *Isaac Albalag*, 141. Aristotle, *Categories*, 12a, 17-18. Touati, op. cit., 271, n. 15).

⁸The terms *peloni* and *almoni* are used in Rabbinic Hebrew for "someone", where the identity is either not known or irrelevant.

⁹Abravanel gives a lengthy discussion of this whole topic and explicitly rejects Gersonides' interpretation (Isaac Abravanel, *Commentary on Genesis*, ad locum).

-435-

CHAPTER V

THE terms "light" ('or) and "dark" (*hoshekh*) are equivocal. For the term "light" is first predicated of sensible light and "darkness" is predicated of the absence of this sensible light. This [use of these terms] is frequent: e.g., "the light of the sun", "day-light". Analogously with the term "darkness": "the sun shall be darkened in its going forth" ¹and "At Tehaphnehes also the day shall be darkened." ²This usage is quite frequent. By a bit of imaginative application the term is also used as follows: "Their visage is blacker than coal." ³By extension these terms have been used to signify the ability to see perfectly, e.g., "how my eyes have brightened" ⁴or the inability to see, e.g., "And those that look out through windows shall be darkened." ⁵In the latter passage [the term "darkness" is used] because in darkness perception of visible objects is not perfect. [Furthermore,] since the form [of a substance] is similar to light in so far as it is the perfection of the substance of which it is the form, just as light is the perfection of a transparent body in so far as it is transparent, -- in addition, the form renders the substance intelligible; indeed, it is only from this aspect that the substance is intelligible, ⁶just as light ^a makes objects capable of receiving light ^b visible -- so the lack of form ^c is compared to darkness and obscurity. It is said: "the stones of thick darkness and of the shadow of death", ⁷referring to the prime matter because of the absence of forms which attaches to it, as we have explained in our commentary to the Book of Job. Accordingly, in the passage "and darkness was upon the face of the deep" ⁸[the term "darkness"] denotes the element of earth, which is most lacking in form and goodness, such that it is the lowest of all existing things. And since it is the most lacking in

¹Isaiah, 13:10.

²Ezekiel, 30:18. The Massoretic text records two readings "*hasakh*" and "*hoshekh*", the latter referred to as an alternative reading. Gersonides, however, follows the latter. I have translated the passage according to his text.

³Lamentations, 4:8.

⁴I Samuel, 14:29.

⁵Ecclesiastes, 12:3.

⁶Aristotle, *Metaphysics*, VII:6.

⁷Job, 28:3.

⁸Genesis, 1:2.

-436-

form, the earth is compared to prime matter; as it is said: "for dust thou art and unto dust shalt thou return." ⁹[That is,] man shall return to the dust that he [formerly] was. Scripture says that darkness is "on the face of the deep"; for the deep is obviously the lowest place of the waters. Hence, "the face of the deep" is the lowest level of the water; and the meaning of the phrase "on the face of the water" [*al penai ha-tehom*] is "at [etzel] the lowest level of the water". For the term "al" has this connotation; e.g., "and the next unto him shall be the tribe of Menasseh" ¹⁰ and "And thou shalt put pure frankincense, with each row", ¹¹ meaning by *the side* [etzel] of each row, as is explained in *Menahot*. ¹²

Maimonides, however, maintains that the term hoshekh refers to the element of fire. ¹³He supports this claim by citing the passage: "when ye heard the voice out of the midst of darkness"; ¹⁴and elsewhere it is said, "out of the midst of the fire". ¹⁵This is a sign that indicates fire is called "hoshekh". Similarly, "all darkness is laid up for his treasures. A fire not blown by man shall consume him." ¹⁶This too shows that darkness is fire. ¹⁷Now, according to Maimonides, the element of fire is called "hoshekh" because the element of fire is not luminous, as has been explained in the sciences. ¹⁸Nevertheless, it exhibits light when it becomes enmeshed in bodies.

We reject thisd [i.e., Maimonides'] interpretation [of the term hoshekh]. For it doesn't follow merely from the occurrence [of the term "fire"] in the passage "out of the midst of fire" and the occurrence of the [term "darkness"] in the other passage "out of the midst of darkness" that the term "darkness" denotes fire. The term "darkness" refers to the dark cloud that was present from which fire emerged; for it is the nature of this kind of cloud to be very dark. Accordingly, it is said: "These words the Lord spoke unto all your assembly in the mount out of the midst of the fire, of the cloud, and of the thick darkness [arafel]." ¹⁹It has been already explained to you that the people heard God's words out of the midst of the fire, the cloud and the thick darkness, which is the same thing as darkness [hoshekh]. Thus, it is clear that when it is said: "when

¹⁰Numbers, 2:20.

¹¹Leviticus, 24:7.

¹²*B.T.Menahot*, 96a.

¹³Maimonides, *Guide*, II: 30.

¹⁴Deuteronomy, 5:20.

¹⁵*Ibid.*, 4:36.

¹⁶Job, 20:26.

¹⁷These passages are all cited by Maimonides.

¹⁸Aristotle, *Meteorologica*, I: 3-4

¹⁹Deuteronomy, 5:19.

⁹*Ibid.*, 3:19.

you heard the voice out of the midst of the darkness" [*ha-hoshekh*], it is not necessary to construe the last term as denoting fire. The same is true in the case of the passage "All darkness is laid up for his treasures": even if we admit that the term *hoshekh* refers to fire in this passage, it [really] refers to the cloud from which the flames and other destructive things emerge, for this cloud is frequently very dark.

Moreover, it is difficult on Maimonides' interpretation to account [for the passage "and darkness was on the face of the deep"]; why should fire be assigned to the lowest level of the water? It would be more appropriate to place it on top of the air [literally "wind" (*ruah*)], not on the face of the water. All the more so was it inappropriate to place it on the lowest level of the water, as is

obvious. ²⁰Moreover, the earth is the farthest of all the elements from the light, since it is a very dark body. Accordingly, it should be described by the term "dark" more so than any of the other elements. Moreover, it is more lacking in form and goodness than any of the other elements. Hence, it should be called "darkness", as we have explained before. However, the term "darkness" is used by extension to connote someone who cannot apprehend the intelligible essences of things, which are the forms, just as the term "darkness" connotes by extension the absence of forms; as it is said, "the fool walketh in darkness". ²¹For this reason "light" is used to connote somebody who has perfect apprehension; as it is said of God (may He be blessed), "The light dwelleth with Him." ²²On this basis it is said: "Who coverest Thyself with light as a garment". ²³This light refers to the Separate Intelligences that are the movers of the heavenly bodies. The phrase: "Let there be light" ²⁴has the same meaning. Our Rabbis of blessed memory have already indicated this point to us ^e in the Midrash. Thus, "And God saw the light, that it was good", ²⁵-- Rabbi Juda bar Simon maintained: God set aside the light for Himself. This is like a king who sees a good portion and says, "this is for me". Similarly, when God created the light, He said "No creature can use it except me, for it is said: "The light is with Him." Rabbi Abin the Levite said: God took the light and wrapped Himself with it like with a Tallit and illuminated His world by its rays; as it is said, "Who coverest Thyself with light as a garment". The Rabbis say that God reserved the light so as to give it to the righteous in the world

²⁰Since fire is the lightest of the elements, it should be the highest, i.e., above the air.

²¹Ecclesiastes, 2:14.

²²Daniel, 2:22.

²³Psalms, 104:2.

²⁴Genesis, 1:3.

²⁵Genesis, 1:4.

-438-

to come. This is like a king who sees a good portion and says "this is for my son"; as it is said: "A light is planted for the righteous". ²⁶It has already been demonstrated to you that all the Rabbis agree that this light is not the visible light but the light of understanding. ²⁷This entire discussion is quite extraordinary to one who considers and understands the nature of this dispute amongst the Rabbis. Rabbi Juda bar Simon believes that it is utterly impossible for the human intellect to apprehend the Separate Intelligences; whereas the other Rabbis believe that it is possible for the human intellect ^f to apprehend the Intelligences in some fashion by virtue of what emanates to it from their illumination such that it achieves immortality through this apprehension, although perfect apprehension of them is impossible, as has been shown in Book I. The statement of Rabbi Abin the Levite is especially striking. It shows that this light is prior in causality to all other created things. For this reason this wise man said that God looked at the world of Separate Intelligences and caused to emanate existent things from them.

²⁶Psalms, 97:11. This quotation from the Midrash is from Midrash on Psalms, Psalm 27 (The Midrash on Psalms, trans., W. Braude (New Haven, 1959), vol. I p. 365.

²⁷*Or ha-sekhel*. Gersonides is referring to his discussion of this Midrash in *The Wars of the Lord*, vol. 1, Bk. 1, chap. 12, p. 222.

-439-

CHAPTER VI

THE term *ruah* is equivocal. It connotes the wind that, blows; as in "[And the Lord turned] an exceeding strong west wind." ¹ This usage is frequent. From this meaning the soul is figuratively called "*ruah*", since the natural heat [of the body] is the first organ of the soul, and its substratum is the spirit "*ruah*" that is generated in the heart which is conveyed to the limbs by means of the arteries. The term *ruah* also connotes the element of air. Accordingly, it is said: "The spirit of God [hovered]." ² The term *ruah* is put into genitive construction with the term "*elohim*" to indicate the great quantity of air; for the blowing wind ^a is small in quantity. And since the term *ruah* is equivocal [connoting both] the element of air and the blowing wind ^b, the Torah describes it in terms of quantity to indicate which kind of *ruah* is being referred to [in this passage]. This is quite common in Hebrew, i.e., [a term] is put into genitive construction with one of the names of God to show that the object ^c is large or strong. [Examples of this are: "Like the mighty mountains", ³ "A very flame of the Lord", ⁴ "the arrows of the Almighty" ⁵ and "like the voice of the Almighty". ⁶ Moreover, when in this verse it is said that the *ruah* "hovered over the face of the water", it signifies that [the element of air] rests upon the surface of the [element] of water. ⁷ The same is implied by the phrase "As an eagle.... hovereth [*yerahef*] over her young" ⁸: the verb *rahaf* means "rest".

Indeed the term *ruah* includes both the elements of air and fire; for the Torah refuses to use the term '*esh*' to refer ^d to the element of fire in order to indicate the difference between it and ordinary fire. The element of fire is like air but it is dry and warmer than air. Concerning this scientists have said: "The air has three ^e parts: the lower part in which the aref found rain, dew, and other similar phenomena; the middle part ^g which is warm and moist; and the upper part which is warm and dry." ⁹

¹Exodus, 10:19.

²Genesis, 1:2. The verb "*merahef*" ("hover") connotes hanging in air.

³*Keharrei el, Psalms, 36:7.*

⁴*Shalhevetyah, (literally, "the flame of God"). Song of Songs, 8:6.*

⁵*hitzei shadai, Job, 6:4.*

⁶**Keqol shadai**, Ezekiel, 1:24. In all these phrases a name of God is used as a simile to express the magnitude of the object in question.

⁷Aristotle, *Meteorologica, 1:3.*

⁸Deuteronomy, 32:11.

⁹Aristotle, *Meteorologica, 1:3.*

CHAPTER VII

THE term *raqia* ¹ connotes anything beaten [or flattened] out [but] retaining its form. For example, "and they beat the gold into thin plates" ², "[let them be made] beaten plates", ³ and "To Him that spread forth the earth above the waters". ⁴ [In the last passage the term *raqia*] connotes that God spread out part of the earth higher than the elemental waters, i.e., the high part in the visible portion of the earth, which is the necessary instrument for the development of this visible ^a part [of the earth], as has been explained. ⁵ From this is derived the phrase: "Can'st thou with Him spread out the sky". ⁶

The term *raqia* is, however, used in Hebrew in a specific sense to connote the heavenly body; e.g., "Let there be lights in the firmament of the heavens"; ⁷ "And God set them in the firmament of the heaven". ⁸ In this sense it is said: "[let fowl fly above the earth] in the open firmament of the heaven"; ⁹ for the birds fly above the earth near the region of the heavens ^b, which has

circular not rectilinear motion, i.e., it does not move up or down, as the parts of the elements do. ¹⁰ Accordingly, it is said "Let there be a firmament in the midst of the waters", ¹¹ i.e., the heavenly spheres. Indeed, the movers of the heavenly spheres were created first with respect to causal and natural priority; for they are the form ^c and perfection of the heavenly bodies, and the form is prior in being although posterior in generation. ¹² On the other hand, it is said "in the midst of the waters"; for it has already been demonstrated that there was a body not preserving its shape from which both the upper and lower created things were generated. In Hebrew, the feature of not remaining

¹ The term under investigation in this chapter occurs first in Genesis 1:6 and is usually rendered in English as "firmament". As we shall see, this word is quite flexible and diverse in its semantic possibilities.

¹⁰ Aristotle, *On the Heavens*, I:1-5.

¹¹ Genesis, 1:6.

¹² Aristotle, *Categories*, [12](#); *Metaphysics*, V: [11](#).

² Exodus, 39:3.

³ Numbers, 17:3.

⁴ Psalms, 136:6.

⁵ Gersonides, *The Wars of the Lord*, Bk. 6, pt. 1, chap. 13.

⁶ Job, 37:18.

⁷ Genesis, 1:14

⁸ *Ibid.*, 1:17.

⁹ *Ibid.*, 1:20.

in one state is attributed to water. As it is said: "as water spilt [on the ground]"; ¹³ or, "the hearts of the people melted and became as water". ¹⁴ In the last passage the Torah compares the heart of the people to water because of its softness and easy affectibility. Accordingly, the body that lacks the nature to preserve its shape is compared to water. Thus ^d, David says, "Praise Him, ye heavens ^e of heavens, and ye waters that are above the heavens". ¹⁵ [The waters referred to here] are identical with the body that doesn't keep its shape surrounding the spheres, so that the motions of one sphere do not interfere with those of another sphere.

Maimonides interprets the term "*raqia*" as the coldest part of the air in which the clouds and the rain are generated. He was led to this interpretation by his reluctance to believe that there is water surrounding the heavenly body. ¹⁶ It should be noted that besides the fact that our interpretation is the true one, since it has been previously demonstrated, it is also the view of all the earlier Sages of the Torah, as can be clearly seen from their discussions of this passage. In *Midrash Rabbah Genesis* it is said: "When the Holy One Blessed be He said" Let there be a firmament in the midst of the waters "the middle drop congealed and formed both the lower and upper heavens. On the first day the heavens were liquidy; but on the second day they hardened; ¹⁷ " i.e., God gave them stability and permanence. [Accordingly, when it is said]: "Let there be a firmament", [this means] "Let the firmament be hardened." Rabbi Juda bar Simon said: "Let a lining be made for the firmament; as it is said, "And they beat the gold into thin plates". ¹⁸ Rabbi Haninah said: "The fire from ^f above burst out and dried up the firmament", etc. Rabbi Pinhas in the name of Hoshea said: "As there is a void between the earth and the firmament, so there is a void between the firmament and the upper waters; [as it is said], "Let there be a firmament between the waters", meaning midway between them. Rabbi Tanhuma said: "I will state the proof. If it said, 'And God made the firmament and divided the waters...which are upon the firmament', I would say that the water lies directly upon the firmament itself. Since, however, it

is stated 'And between the waters which are *above* the firmament', it follows that the upper waters are suspended by divine decree". ¹⁹

Now there are proofs for you in this Midrash that the Rabbis under-

¹³ II Samuel, 14:14.

¹⁴ Joshua, 7:5.

¹⁵ Psalms, 148:4.

¹⁶ Maimonides, *Guide*, II: 30. (cf. Commentaries of Shem Tov, Crescas, and Efyodi).

¹⁷ *Midrash Rabbah*, Genesis, IV: 2-3.

¹⁸ Exodus, 39:3.

¹⁹ *Midrash Rabbah*, Genesis, IV:3. I have followed the commentary of Yefei To'ar in my translation of *al* and *mèal*.

-442-

stood the term "*raqia*" as meaning the heavenly body. Firstly, they said: "Let the lower heavens and the upper heavens be made". This is not appropriately said, [as Maimonides believed], of the clouds or of the place where the clouds are formed. ²⁰ Secondly, in the statement "a fire from above burst forth and dried up the firmament" [the term *raqiU0+300a*] does not properly refer to the clouds; for the thickening [of a cloud] consists in [increased] moisture and becoming ^g water, not in being dried up. And the cause of this [thickening] is the coldness in that part of the air, as has been explained in the *Meteorologica*, not the fire. ²¹ All the more so is it inappropriate to maintain that [the term *raqia*] refers to the coldest part of the air in which the clouds are formed, [as Maimonides maintained]. The phrase "fire from above" is especially striking; for we believe that a thing acquires stability of form only through drying, and since fire is the cause of this drying, he [Rav Haninah] assigned this activity to fire. And to show that this nature is not like the ^h nature of the elemental fire, he says: "fire from above". ²² Similarly, in many passages [in the Midrash] it is said that the heavens were formed from fire and water, i.e., they contain two natures, one preserving its shape and the other not preserving its shape. God forbid that this wise man [i.e., Rabbi Haninah] implied that God made the heavens by means of some instrument, e.g., fire or something like it; rather, what he means is that God gave the heavens a nature by means of which it keeps its form.

The third proof-text is the statement "as there is a void between the *raqia* and the earth, so there is a void between the *raqia* and the upper waters". Even if the *raqia* were a cloud or the region where clouds are located, the upper waters would also be there [hanging in suspension] by [divine] power, not [floating] on the *raqia*. Nevertheless, our interpretation of this term is compatible with this Midrash. For the Rabbis say that the thickness of the *raqia* is equal to the magnitude of the distance between the earth and the *raqia*. ²³ The same is true, according to them, for the magnitude between one *raqia* and another. ²⁴ It has been proven that between these heavens there is the body that doesn't preserve its shape; for it is impossible that a vacuum exist. For the Rabbis say in *Midrash Rabbah*: "The distance between the earth and the *raqia* is comparable to a 500 year journey; and ⁱ the thickness of the *raqia* is [also com-

²⁰ Maimonides, *Guide*, II:30.

²¹ Aristotle, *Meteorologica*, I:9-10.

²² According to Aristotle liquids are not dried by fire but dissolved. Hence, Gersonides argues, the fire that is responsible for drying the heavenly waters is not natural but supranatural (Aristotle, *Meteorologica*, IV: 6).

²³Jerusalem Talmud, J. Berachot I:2c. Midrash Rabbah, Genesis, VI:6.

²⁴In Rabbinic literature there is the belief in seven heavens. (B. Hagigah 12b).

-443-

parable to] a 500 year journey; and [the distance] from one *raqia* to another is [also comparable to] a 500 year journey." ²⁵

The statement of Rabbi Tanhuma that the upper waters are suspended by divine decree is quite striking. It indicates that the nature of the upper waters is not like the nature of the lower waters, which are heavy and are sustained by the earth. Rather they are suspended by God's word, i.e., nothing supports them; for they are neither heavy nor light. Accordingly Rabbi Tanhuma made the subtle interpretation: "If it had been written 'And God separated between the waters that were on [a] the *raqia*," this would have meant that the waters were placed on the body of the *raqia*", i.e., they were on top and the *raqia* supports them. But [the Torah] says that they were "above [méal] the *raqia*"; it does not describe them as being on the firmament, since they are supported by themselves [i.e., without any physical support]. This is an extraordinary subtle interpretation. ²⁶

The Rabbinic teaching that the heavens consist of fire and water is only a metaphor, and is not to be taken literally. For in *Midrash Rabbah Genesis* they say: "Heavens" [are so called] because men wonder at them saying, 'they are made of water, they are made of fire'. ²⁷ The Rabbis point out that this statement [i.e., that the heavens are made of fire and water] is only a metaphor and simile. Thus, Rabbi Akiba says in the chapter "One does not interpret": when ye arrive at the stones of pure marble, say not 'Water, Water!' For it is said: 'He that speaketh falsehood shall not be established before my eyes'." ²⁸ Now this sage called the heavenly bodies "stones of pure marble", and did so because they are transparent and free from any grossness and thickness. Indeed, he wanted to indicate that the body that doesn't preserve its shape, which exists in the heavens, is called "water" only metaphorically; it does not have the same nature ^k as the elemental waters.

Ben Zoma's saying in the same chapter, "between the upper and the lower waters there is only a space of two fingers width", ²⁹ is also very striking. The lower waters, i.e., the matter of the sub-lunar world, is dis-

²⁵*Midrash Rabbah, VI:6.* These finite temporal intervals indicate that there is no vacuum; for if there were a vacuum, the velocities would be instantaneous (Aristotle, *Physics, IV. 8*).

²⁶In Rabbi Tanhuma's midrash Gersonides finds support for his theory of the body that doesn't preserve its shape, especially its presence in the celestial domain. This body is neither heavy nor light, since it is shapeless and formless. Only the sub-lunar elements are heavy or light. Hence, this body cannot be identified with the sub-lunar element of water, which is of course heavy. When Scripture refers to the "upper waters" then, it is this shapeless body that is being referred to (J. Staub, *The Creation of the World.....*, 249, n. 184).

²⁷*Midrash Rabbah, Genesis, IV: 7.*

²⁸This chapter is in *B. Hagigah*; the discussion is on p. 14b, Psalms, 101:7.

²⁹*B. Hagigah*15a. The *Talmud* reads "three fingers".

-444-

tinguished from the upper waters with respect to the elemental forms with which God (may He be blessed) has endowed it. By means of these forms the sub-lunar matter is able to receive all

the [other] forms. Now these elemental forms exhibit two active powers, i.e., heat and cold, and by virtue of these powers they act upon each other. ³⁰But the upper waters do not exhibit this feature. ³¹It is well-known that in Hebrew the term "finger" connotes the active power. As it is said: "The finger of God", ³²or "The finger of God was engraven upon the tablets." ³³This is the case because the hand is an extraordinary means for accomplishing anything, and this is so because of the fingers with which it has been created. This is quite obvious.

There are other sayings of our Rabbis (of blessed memory) that indicate clearly that the *raqia* is the heavenly body. On the verse "These are the offspring of the heavens and of the earth" ³⁴the Midrash comments: "Rabbi Azariah in the name of Rabbi [Jehudah the Prince] says: ³⁵This was said in reference to the One above [i.e., God]" Now all that you see are the offspring (*toldot*) of the heavens and earth, as it said, "In the beginning God created the heavens and the earth". On the second day, His creations were of the celestial world: "And God said, 'Let there be a firmament'¹; on the third, they were of the terrestrial: And God said: 'Let the earth put forth grass'; on the fourth, of the celestial: 'Let there be lights', etc." ³⁶It is clear from this Midrash that this sage believed that the *raqia* created on the second day refers to the heavenly bodies.

³⁰Aristotle, *Meteorologica*, IV:1.

³¹The upper waters are the celestial domain, which has a completely different chemical structure. The heavenly bodies are neither heavy nor light, neither hot nor cold (Aristotle, *On the Heavens*, I: 1-4).

³²Exodus, 8:15.

³³Exodus, 8:15 and 32:16. The Biblical text reads, however "the writing of God".

³⁴Genesis, 2:4. I follow the translation of the *Midrash* here, which translates *toldot* literally as "offspring".

³⁵Rabbi Azariah's comment refers to a preceding statement made by Rabbi Simeon ben Lakish that made a distinction between things that have offspring [i.e., generations] and those that do not. According to this distinction the former are subject to decay and death and cannot create, whereas the latter are not subject to decay or death and can create. Rabbi Azariah naturally remarks that the latter set of conditions is satisfied only by God.

³⁶*Midrash Rabbah*, *Genesis*, XII: 7 (end)-8.

CHAPTER VIII

YOU already know from the preceding that the generation of the universe by God occurred in no time, since [its generation] was from nothing to something. ¹Thus, our Rabbis maintain that the heavens and the earth were created simultaneously. As it is said in the Chapter [called] "One Does Not Interpret": "Both were created as one. For it is said, 'Yea, Mine hand hath laid the foundation of the earth, and My right hand hath spread out the heavens'^a; When I call unto them they stand up *together*.'" ²It is therefore evident that the description of creation as being completed in six days is not to be construed as [implying] that the first day precedes ^b the second, for example, by one [whole] day [i.e., twentyfour hours]. Rather, they said, this is in order to show the priority amongst various created things. For example, the movers of the heavenly bodies are causally and by nature prior to the heavenly bodies, whereas the latter are causally and by nature prior to the elements and to that which is generated from them. Now, the elements are prior to that which is generated from them according material priority ³, and the compounds

¹The phrase



refers to the generation of the universe, and thus does not rule out the prior existence of formless matter. Now such a generation was previously shown to require *no* time (Supra, Bk. 6, pt. 1, chap. 20), since it is a change from nonbeing to being, wherein there are no intermediary states that have to be successively reached via *motion and over time* (Aristotle, *Physics*, V: 1, VI: 5. cf. Thomas Aquinas, *Summa Contra Gentiles*, II: 19. Wolfson, *Crescas' Critique of Aristotle*, 540-50).

²B. *Hagigah* 12a. The Biblical citation is from Isaiah 48:13. [my italics]

³In *Categories* 12, *Physics VIII*: 7,260b, 16-19 and *Metaphysics V*:II, Aristotle distinguishes amongst several senses of "prior" and "posterior". That which is prior by nature (πρότρου τη + ὄσση) to other things is that without which the others cannot be (*Metaphysics* 1019a, 2-3); or, that which is the cause of the others' existence (*Categories* 14b, 13-14). In medieval philosophical Hebrew this was called *qodem beteva* or *qodem besibah* (Maimonides, *Treatise on Logic*, chap. 12). However, there does not seem to be in Aristotle a special term corresponding to Gersonides' expression *qedimah hiyyulanit*, "material priority".

Nevertheless, as his employment of this phrase shows, Gersonides has in mind the very Aristotelian idea of the hierarchical ascent of the levels of being, in which each lower level serves as matter for each higher level. In this sense, the lower is materially prior to the higher. Thus, to use Gersonides' examples, the simple elements (e.g., water, fire) are materially prior to the compounds made from them; yet, some compounds are materially prior to others in so far as they are matter for the latter (e.g., plants are food for animals). In this teleological way of thinking each lower level exists for the sake of the higher level, just as matter exists for form [Gersonides, *Commentary on the Torah, Genesis; The Wars of the Lord*, vol. 1, Book I, chap. 12. M. Furth, *Substance, Form, and Psyche: An Aristotelian Metaphysics*, (Cambridge University Press: Cambridge, 1988), 88 ff].

-446-

of the elements ^c are also [related] to each other by this kind of priority. For example, the plant is prior to the animal; and similarly ^d the imperfect animal is prior to the perfect animal. In the same way, an aquatic animal is prior to a flying animal, and the latter is prior to a walking [i.e., terrestrial] animal, while the latter is prior to the rational [animal, i.e., man]. ⁴For an aquatic animal produces an imperfect egg, whereas the bird produces a perfect egg; the walking animal, however, produces a living animal in its own body. For this reason Aristotle says in *The Book of Animals* that the bird is more perfect than the aquatic animal and the walking animal more perfect than the bird. ⁵And there is no doubt that man is the most perfect animal amongst the walking animals.

In this way the [following] difficulty raised by some of our Rabbis can be removed. [They asked]: By what means were the first, second, and third days measured if the heavenly bodies were not in existence until the fourth day? This is what they say on this question: "It [i.e., the light created on the first day] is identical with the luminaries; for they were created on the first day, but He did not assign them [their places] until the fourth day." ⁶That is, God did not assign to their generation any temporal [relations] before the fourth day; rather, they [all] existed on the first day, since everything was created simultaneously [on the first day] through the will of God. There is no doubt that the Rabbis' phrase "He did not assign them [their places] until the fourth day" must be understood in the way we have mentioned. For it is impossible to say that the heavenly bodies were created on the first day separate [from their spheres] and then afterwards were attached to the firmament [i.e., their spheres] on the fourth day, since they are not attached to the firmament

⁴As Touati notes, in these examples one level of organic life furnishes the material conditions for the emergence of the next higher level of life. In this sense the priority involved can be said to be material priority. This point is based upon Aristotle's hierarchical doctrine of the three levels of soul: (1) the nutritive soul, possessed by plants; (2) the sensory soul, possessed by animals, and (3) the rational soul, possessed by man alone (Aristotle, *On the Soul II*: 2). Each organism on level 2 possesses the nutritive soul as well; and each organism on level 3 possesses the sensory soul and nutritive soul. (Touati, *La Pensée*, 269).

⁵Aristotle, *History of Animals, VIII*: 1, *On Generation of Animals, II*: 1.

⁶*B. Hagigah* 12 a. Maimonides, *Guide II*: 30. I translate the phrase



("But he did not assign them until the fourth day") according to Ginzberg's rendition, which is close to Gersonides' interpretation of this phrase (L. Ginzberg, *Legends of the Jews*, (Philadelphia, 1955) vol. I, p. 23 and vol. V, p. 34, n. 98). In the Soncino translation of the *Babylonian Talmud* the term



is rendered as "were not hung up [in the firmament]". The verb



can mean (a) hang, attach to, suspend; or (b) assign; or (c) make dependent upon (M. Jastrow, *Dictionary to the Targumim and Talmud, ad locum*).

-447-

but are in the deepest part of the firmament, and are fixed ^e and stable. And the claim that God split the firmament and put the heavenly bodies in it is equally absurd. ⁷Hence it is clear that the meaning of the term *tela'an* in this context is "relatedness" [*hityahasut*]; for the noun *tehi'ah* often has this connotation in Hebrew. ⁸

It should be noted that whatever can be generated naturally according to the nature given it by God is such that its creation is not attributed [directly] to God in this marvelous account [of creation]; for He produces such things through nature. Hence, the generation of plants and of animals through putrefaction and from species other than their own [i.e., hybrids] is not attributed to God. Rather, to God is attributed the creation of whatever is not generated naturally other than from its species; for its creation not from its own species was a miracle. ⁹ Accordingly, the generation of homogeneous parts ¹⁰is not attributed to God; for the movements of the heavenly bodies and the capacity in sub-lunar matter to receive all forms via the elemental forms -- which [forms] God created in this matter such that from it homogeneous parts, species of plants and animals born from putrefaction should be generated -- are sufficient.

¹⁰In his biology Aristotle distinguishes between the (a) "uniform", or "homogeneous" parts of a living animal, e.g., blood, semen, marrow, and (b) the non-uniform parts, e.g., hands, feet, and face. The latter are made out of the former. The uniform parts are then posterior to the elements according to natural and causal priority but are prior to the non-uniform parts (see the excellent account of this topic given by A. Peck in the Introduction to his Loeb Classical Library edition of Aristotle's *Generation of Animals*, xlviiii-xlix).

⁷Presumably Gersonides rejects this claim because the whole celestial domain, both the spheres and the heavenly bodies [i.e., stars and planets] were created together, and the celestial domain is not such as to be rent asunder.

⁸Gersonides takes the verb

to connote in this context the idea of relation or hanging together rather than the idea of being

hung on or attached to something. Thus, he interprets this Midrashic passage as follows: The first act of creation involved the generation of the *entire* heavenly domain at one fell swoop; on the fourth day these bodies were assigned their various temporal and astronomical relationships to each other.

⁹Before he begins his explanation of "the story of creation" Gersonides anticipates and answers a question that might be asked: why is the creation of certain classes of things omitted in this account? Since the thrust of this story is to stress the creative activity of God, those things whose generation can be given a perfectly adequate *naturalistic* explanation, without bringing God into the story, are omitted, e.g., the production of a mule is explicable in terms of the coming together of a mare and an ass. On the other hand, those things whose normal course of generation is accounted for through members of their own species (e.g., horses, humans and wheat) are mentioned in Genesis I as created directly by God because their appearance was miraculous, i.e. without any natural progenitors. For example, Adam and Eve had no natural father and mother; their generation then was a miracle, or supernatural, and thus attributable directly to God.

-448-

This is obvious to the reader of this book. We have thought this preamble to be worthy of attention before we set out to explain the Biblical account of creation. Now we shall begin our explanation.

The Torah says that at the beginning of creation, ¹¹when God created the heavens and whatever is below them, He created in the sub-lunar matter its first principles: prime matter and the forms of it that are first in order, i.e., the elemental forms. By means of the latter, [prime matter] is prepared to receive all the forms, these [elemental] forms [being arranged in] such a way that the element of earth is near the lowest level of the element of water and [the elements of] fire and air are above the uppermost level of the [element] of water. Now, in the beginning of this entire creation God said that there should be a domain of light, i.e., the domain of angels, which are the movers of the celestial spheres. As soon as He willed this, it came about; no [special] act was required. Now God differentiated this light, i.e., this superior domain [of the Separate Intelligences], from that which is related to it as matter, i.e., the celestial body [itself], which is the darkness in this analogy, although both of them are really one thing; for these forms [i.e., the separate intelligences] are the perfection of the heavenly bodies. In this manner the evening and the morning [which are spoken of as amongst] the things in existence [on the first day of creation] are on the same level of existence; for the form is unified with that of which it is the form, as has been explained in the *Metaphysics* in the section dealing with definitions. ¹²Light and darkness are called "evening" and "morning" [respectively] to increase the esoteric character of this marvelous parable. ¹³In addition the nature of the unity [of form and matter] becomes evident from this account, since from daylight and night-time one complete day results. It is possible to interpret [these words] as signifying that this light exhibits different gradations, some superior to others, some acting as the forms of others, as we have explained in Book 5. Thus, some [of these gradations of light] are [like] darkness relative to that which is their form; [yet] all of them are united in such a way that one order emanates from them, as has been explained. ¹⁴The Torah states that this creation [of light] took place when God said so to indicate that it is an act of will; for with respect to God

¹¹The term *bereshit* ("in the beginning") is to be construed as "in the beginning of the creation", as Rashi indicated in his *Commentary to the Torah*. As Touati points out, the first three sentences of Genesis are really *one* complex clause for Gersonides (*La Pensée*, 276).

¹²Aristotle, *Metaphysics*, VII: 10-12, 15.

¹³One would have expected that light would have been called "morning" and darkness "evening". But Scripture reverses the order of these terms.

¹⁴Gersonides is referring here to the domain of the separate intelligences, which exhibit different grades of perfection. This matter is discussed in Book V, part 3, chapters 7-9.

-449-

there is no utterance by means of letter and sounds, as Maimonides has pointed out. ¹⁵

After indicating the manner of the creation of this first level of existence, the Torah begins to describe the manner of creation of the second level. It relates that God said the heavenly body should be [generated] from a part of the body that doesn't keep its shape and that there should be created a nature that would distinguish the part coming from this body that doesn't keep its shape, which is below the firmament, from ^f that part of it which is above the firmament. This nature that distinguishes between these two parts is the creation of the elemental forms in the lower part of this body by virtue of which this part is prepared to receive all the forms. The upper part of this body does not, however, have this nature; rather it always remains as it is. In this way the sub-lunar matter is "prepared" [*khen*], i.e., as is seen from the presence of the elemental forms in it. Or, the phrase "and it was so" refers to the existence of the elemental forms mentioned in the first stage [of creation]; and the phrase means that the sub-lunar matter initially mentioned in the phrase "and the earth was formless and empty" was of this sort [i.e., prepared by the elemental forms to receive all the other forms]. The Torah did not want [on this second interpretation] to repeat this latter phrase because of its desire for brevity. And since the term *raqia* is equivocal, denoting anything that is beaten [or flattened] out, God called this firmament by a name that would distinguish it -- "heavens". Evening and morning were also, on this level of existence, one thing; for the spheres are the form and perfection of the elements and in this sense they are unified.

Now it is not said of that which was created on the second day, "it was good". For the spheres that were created then were not yet perfected until the creation of the heavenly bodies in ^g them, and this is mentioned on the fourth day, wherein it is said "it was good". Indeed, that which was created of the elemental forms on the second day in the sub-lunar matter was also incomplete; for these forms were created for the other forms that the sub-lunar matter is capable of receiving. This is what is implied in the saying of the Rabbis in *Genesis Rabbah* ¹⁶: "Why is 'that it was good' not written in connection with the second day?" Some of the Rabbis answered: "Because on that day Gehinnom was created." That is,

¹⁵Maimonides, *Guide I*: 65. The verb '*amar*' can connote *willing* or *desiring*, as well as *speaking*. This explanation of '*amar*' in connection with God was made a rule of exegesis by Saadya Gaon. (M. Zucker, *Perushei Rav Saadya Gaon le-Bereshit*, (N.Y., 1984), 31 and 21.

¹⁶The repetition of the phrase "*vayehi khi*", "and it was so" is interpreted by Gersonides as indicating the *preparation* of sub-lunar matter by celestial matter. The Hebrew term *khen* is, Gersonides suggests, derived from the verb *hekhin*, "to prepare". Accordingly, "*vayehi khi*" would mean "And it was prepared".

-450-

by virtue of the capacity of the sub-lunar matter to receive all forms via the elemental forms which were created in it sub-lunar phenomena are subject to destruction and non-existence. ¹⁷ Other Rabbis say: "Because [on that day] schism [was created]." That is, because contraries were created in the sub-lunar matter it is not fitting to say of the second day that it was good, since

these contraries destroy each other. Others say: "Because the making^h of the waters was not finished." That is, the making of the upper waters was not finished, and these waters are the heavenly bodies; nor was the making of the lower waters [completed], i.e., the sub-lunar matter, as we have just explained.

It is important to realize that the separation referred to in this section ¹⁸is not a spatial separation. If it were, this term [*mavdil*] would be otiose in this statement. For the body that is in the *middle* of those¹ waters [v.6a] indubitably separates that which is above it from that which is below it. Thus, the statement "and it shall separate the waters from the waters" [v.6b] would be superfluous. ¹⁹Similarly, the sentence "And He divided the waters which were under the firmament from the waters which were above the firmament" [7b] would be otiose. Moreover, according to this interpretation [i.e., the spatial interpretation of the term *mavdil*], the phrase "and it was so" would be very odd. For after He has made it [i.e., the firmament] there is no need to say "it was so". But it would be necessary to say this if the Torah had not mentioned the fact that God had made the firmament. ²⁰And this would be the case if the Torah had read: "And God said: 'Let there be firmament in the midst of the waters and let it divide the waters from the waters, and it was so'". This is quite obvious. Hence, it is clear that the phrase "and it was so" refers to the generation that God had created in the sub-lunar matter, i.e., the elemental forms that are mentioned in the passage "And the earth was *tohu va-bohu*". ²¹The Torah has indeed given us an insight of great

¹⁷*Midrash Rabbah*, Genesis 4:6. As Touati notes, Gersonides denies a literal Gehinnom, i.e., a specific place of eternal punishment. The term is a metaphor for the processes of natural corruption and destruction (Touati, *La Penée*, 278).

¹⁸Genesis, 1:6-8.

¹⁹In the first part of Genesis 1:6, it is said that the *raqi'a* is in the middle of the waters. Obviously, then it divides in half and separates the waters into two regions, the upper waters and the lower waters. The occurrence of "mavdil" in the second part of verse 1:6 has, therefore a different purpose; for if it had the meaning of spatial separation, it would be redundant. And so would the second clause of the next verse also be superfluous.

²⁰Genesis 1:7a: "And God made the firmament".

²¹The phrase "and it was so" [*va-yehi khen*] at the end of verse 7 is not merely an emphatic repetition of "And God made the *raqi'a*", which it would be if the "separation" referred to in this section connoted a geographical distinction. For already we learned that the *raqi'a* is to be "in the middle of the water" and that God made the *raqi'a*. The phrase "*vayehi-khen*" must have a different connotation: it refers back to verse 2, where it is said that at the beginning of creation God endowed the sub-lunar matter with the elemental forms, which "prepared" [*hekhin*] the primary matter to receive all other material forms.

value in telling us that there is some unity between the sub-lunar matter and the heavenly body; for if there were no unity at all, there would be two gods, one supervising the celestial domain and the other supervising the sub-lunar matter. And this would be the origin of the error of those who believe in two gods. ²²

After the narration of the second stage of creation is completed, the Torah continues with another phase of creation. It relates that God said that the waters -- which naturally encircle the element of earth -- should gather unto one place so that dry land should appear. Indeed, this was necessarily the case when God created in this visible part of the earth something that projects beyond its sphericity and is higher to some extent than the element of water, as has been

explained. ²³Accordingly, it is said, "He spread forth the earth above the waters". ²⁴As soon as God willed it this thing came about. Now God called the dry land "earth"; and, although the term "earth" is used in a general sense to refer to all the elements, as has been pointed out, ²⁵the term "earth" has a specific reference to this element [i.e., earth]. The gathering of the waters God calls "seas" [*yamim*]. The term "seas" is used, not "sea", since the nature of the sea is such that it differs according to the nature of the lands through which it passes, as has been explained in [Aristotle's] *Meteorologica*. ²⁶Our Sages of blessed memory make the same point in *Bereshit Rabbah* [Genesis]: "Isn't there just one sea? Why then does Scripture say: "God called the gathering place 'seas'"? This is because

²²In this paragraph Gersonides has indulged himself in a bit of Talmudic pilpul arguing for the non-superfluity of every phrase in Genesis 1: 6-8. He is particularly concerned to assign a special significance to the verb "*mavdil*" in 1: 6-7 different from the usual translation "separate from" where the connotation is spatial differentiation. Instead, Gersonides claims, the verb has the meaning of *qualitative* differentiation: sub-lunar matter is different from celestial matter in being the recipient of the elemental forms, whose essential contrariety is the source of change and corruption. This exegetical point is confirmed, Gersonides continues, by the phrase "And it was so", which refers back to the first stage of creation, particularly verse 2, where the elemental forms are initially alluded to by the term "*tohu*". Yet, in spite of the significant differences between the celestial and terrestrial matters, they both originate from the primordial "body that doesn't keep its shape". Contrary to the view of the dualists, there is only one creative deity; this God made from this one undifferentiated, shapeless body two formed matters, the celestial and the terrestrial, each considerably different from the other, but having the same origin (Staub, *The Creation of the World*, 310-12).

²³Gersonides, *The Wars of the Lord*, Bk. 6, pt. 1, chap. 13 (cf. Aristotle, *Meteorologica I*: 3, Lee's notes in the Loeb edition are useful, especially pp. 25 - 27).

²⁴Psalms 136:6.

²⁵Gersonides, *The Wars of the Lord*, Bk. 6, pt. 2, chap. 3.

²⁶Aristotle, *Meteorologica II*: 3.

the taste of the fish coming from the region of Acre is different from the fish of Tyre or of Aspamia". ²⁷The Torah teaches us that the sea is identical with the element of water. Aristotle has discussed this point in the *Meteorologica*. ²⁸The Torah says that God knew that what He had brought forth was good; for by means of it there is considerable benefit for the creatures that are generated on the visible part of the earth. Indeed, it is for this reason that God^j brought forth this thing, [i.e., the dry land].

Then God says that the earth should bring forth plants according to their species. First it mentions the most defective kind of plant, the grass that yields seed; and afterwards it mentions the [more] perfect kind of plant, the tree that yields fruit, in which fruit there is a seed from which^k the species is reproduced. This is the order that is most fitting according to nature. For^l the species of trees are more perfect than those of plants, and therefore its activities are more perfect; for we always infer the forms from the activities deriving from them, as Aristotle points out in *On the Soul*. ²⁹Now, as soon as God said that these plants should be generated from the earth, it was so, just as He willed. ³⁰That is, the earth had brought forth grass, [the kind] that yields seed, such that from this seed the species is reproduced, and^m trees bearing fruit, such that in the fruit there is the seed fromⁿ which the species is reproduced. And God knew that what He had brought forth was good. This process of generation was assigned to the third day. Now evening and morning at this phase of creation were unified. For example, the visible portion of

the earth served the purpose of providing a ^o place for the generation of these phenomena. Similarly, the imperfect and perfect plants were unified [into one system]; for all forms that the lower matter were capable of receiving were [so arranged] that some were the form and perfection of others, and in this manner all of them were unified and constituted one process of generation, as was explained in Book 1. ³¹

It is possible to construe the meaning [of verses 11-12] as follows. God said that there should then be a capacity [i.e., potentiality] in the earth to bring forth this vegetation, "and it was so", i.e., God gave this capacity and disposition ³² to the earth by way of a miracle, and the earth brought forth these plants when they sprung up from it, as if the seeds

²⁷*Bereshit Rabbah Genesis V:8*. It is not clear whether the last place, Aspamia, mentioned in this midrash refers to Spain or to a village Apamea in Northern Israel (Staub, p. 313, n. 293).

²⁸Aristotle, *Meteorologica II*: 2.

²⁹Aristotle, *On the Soul I*: 1, II: 1 (end).

³⁰Genesis 1:11. "And it was so."

³¹Gersonides, *The Wars of the Lord*, vol. 1, Bk. 1, chap. 6.

³²*Hakanah* which is of the same root as *khen* in "*veyehi khen*".

had been planted in the earth. These plants did not ^p exist all together at the time of the creation, as did the other things created. Thus, it is said afterwards: "No shrub of the field was yet in the earth, and no herb of the field had yet sprung up; for the Lord God had not caused it to rain [upon the earth]". ³³ This indicates that [only] after the creation mentioned here [i.e., in Genesis 2:5] was there [actual] growth. This is pointed out in *Breshit Rabbah*: "And the earth brought forth something that was deposited in it;" i.e., it is like a deposit in it. ³⁴ Moreover, the Rabbis say there: "The generations [toldot] of the earth were [created] at the beginning, as the School of Hillel maintained. And [the earth] delayed for three days, the first, the second, and the third, and then brought forth three generations: trees, grasses, and the Garden of Eden". ³⁵ The Rabbis point out that the [actual] growth occurred ^q some time after God (may He be blessed) had given the earth the capacity for reproduction. God knew that these plants that He brought forth were good. Consequently, the Torah does not say "And God *created* grass, herbs, etc." as it is said of other creations. [For example], it is said "And God made the firmament", or "And God made the two [great] lights", or "And God created the beast of the earth", or "And God created men". Rather, it says [of the plants], "And the earth brought forth" to indicate that ^r what God had created of the plants did not complete its development, as was the case in the other creations. For in the other cases God created them in their complete form on the day of their creation.

It should be noted that the Torah does not say with respect to the creation on the first day "And God made the light". For that ^s light is the form of the heavenly body and a form has no inherent generation; rather, it is generated along with the generation of that of which it is the perfection. Nor is it correct to think that this form is not tied to the heavenly body because it was originally assumed that it was a separate [form]. We have already pointed out that in positing these forms as separate we want to say merely that they do not perform their special activities, i.e., self-knowledge, by means of a corporeal organ, as is the case with material forms.

Moreover, it is possible to explain why it is said, "And the earth brought forth", and not "and God made grass and herbs" [as follows]. This kind of living thing [plants] does not assume another form as the final perfection of its generation, as occurs amongst the animals. Amongst

the latter, it is observed that at first there is the nutritive function; then its development reaches a certain [level of] perfection at which

³³Genesis 2:5.

³⁴*Bereshit Rabbah XII:4*. The term *toldot* can also mean consequences, results.

³⁵*Ibid.*, XII:5.

-454-

the animal soul [i.e., motor, perceptual, and appetitive powers] is acquired. Thus, in the animal another principle is required besides the principle that God had then placed in the water and the earth. Hence, [in the case of animals] their creation is attributed to God. But the plants do not require another principle besides the principle that God had then^t placed in the earth to bring forth these plants; for they do not have any additional form besides that of growth.

With the completion of the account of the third phase of creation the Torah then begins to narrate the next phase of this process. It relates that God said that there should be light-emitting bodies in the firmament of the heavens, i.e., the sun, moon, and other heavenly bodies. ³⁶God desired their existence so that there would be a distinction between day and night; i.e., from them there would result in this world of sub-lunar matter contrary phenomena by virtue of day and night, which are [themselves] generated from these [bodies]. From these bodies ³⁷the four different seasons of the year result in this manner. Now the day and the night that are generated from these bodies are generated from each of the kinds of orbits that these bodies exhibit: the day of a heavenly body occurs when its activity upon the visible part of the earth is especially strong, whereas its night will result when its influence is minimal. ³⁸For example, just as the day of the sun [occurs] when the sun is on the horizon and night [occurs] when it is below the horizon, so too the day of the sun [occurs] when the sun is in the northern constellations and its nights [occur] when it is in the southern constellations. In this manner the four different seasons of the year are derived from the sun.

The Torah also mentions a second advantage resulting from the existence of these luminaries. From them are derived different activities by virtue of which each luminary is distinguished from the others, and the luminaries are signs of these activities by means of which they are differentiated. Indeed, this is why they give rise to seasons, days, and years. For example, in a particular season that which results is determined by a specific heavenly body, whereas in another season another body determines what is to happen; so that one could say that in this hour Saturn is dominant, but that in a second hour Jupiter is dominant [or] that the dominant body on this day is Saturn whereas on another day the sun is dominant. The same is true for years and other periods longer than a year in which certain heavenly bodies are dominant, as has been empirically

³⁶Genesis 1:14.

³⁷Although the manuscripts consulted and the printed editions all read "



", the context requires "



", which is the reading in the *Commentary on the Torah*, Genesis, 11c.

³⁸

refer to the presence of the star or planet in the northern or southern hemispheres respectively (cf. *Commentary on Torah*, 11c).

-455-

confirmed by those familiar with judicial astrology. It is evident from our discussions in Book 5 ³⁹ that these two factors [i.e., the day-night cycle of the heavenly bodies and their specific influences], which have been mentioned in the creation of these heavenly bodies, are the cause of the perfection of the diversity of [the processes of] generations in the sub-lunar matter.

The Torah mentions that God had a third purpose in mind when He created these luminaries: these bodies were to illumine the earth; ⁴⁰ for in this way man and the other animals that have the sense of sight would be perfected. This is obvious. Without light this organ of an animal will not apprehend any of its objects; and the visual apprehension of these objects is essential for the animal, since it is one of the most important factors in the animal's flight from harmful things and its pursuit ^u, of beneficial things. In man, vision is, in addition, important in leading to perfection of intellectual knowledge, since the intellectual principles are acquired from sensation, and the sense with the greater ^v relevance for these principles is the sense of sight. This is obvious. And since God wanted, through the creation of these heavenly bodies, that these activities be derived from them ^w, it is clear that this is the reason why He created them in the most perfect way with respect to their distance and proximity, their size, the differences in the colors of their rays, their velocities, and the other properties, [all] having this purpose, so that from all of them these advantages result in the most perfect way possible.

The Torah records that as soon as God willed [their creation] they came about accordingly ^x. Then it goes on to narrate the manner of this creation. It says that God made two large luminaries, the sun and the moon, and made them larger than the other heavenly bodies, since sublunar phenomena are in greater need of the former than of the latter. Thus, the sun and the moon have to be sufficiently large so as to prevail over the other heavenly bodies, as we have explained. Because of this the Torah relates that God made the sun to rule over the day and the moon to rule over the night; the other celestial bodies also have some ^y dominance, as has been pointed out. ⁴¹ The Torah reports that God made them in such a way that these advantages would be effected through them: that is, they will illumine the earth so that animals can see their senseobjects; they will rule over day and night in such a way that from them will be derived the various events that occur in the sub-lunar world, i.e.,

³⁹Gersonides, *The Wars of the Lord*, Bk. 5, pt. 2, chap. 3.

⁴⁰Genesis 1:15.

⁴¹Gersonides, *The Wars of the Lord*, Bk. 5, pt. 2, chaps. 3,5,9.

-456-

one time one heavenly body will prevail, whereas at another time another body will be dominant (as has been mentioned). [They have been created in such a way that] the light of a heavenly body, i.e., when it is on the horizon, is distinguished from its darkness, when it is below the horizon. Similarly, the light and darkness of a body is related to the four periods that result from the various rotations of the heavenly body, as has been explained. ⁴² Thus, it is said in this context, "to divide the light from the darkness", which is interchangeable with the earlier phrase "to divide the day from the night", in order to provide greater understanding of the meaning of this whole passage. ⁴³ For one might think that the term "day" and "night" here mean only the diurnal rotation. Therefore, these terms are transferred to "light" and "darkness". Accordingly,

when it is said, "to rule over day and night", ⁴⁴ this phrase is interchangeable with the phrase "let them be for signs, for seasons, for days and years". ⁴⁵ This clarifies what we have said with respect to the phrase, "for signs, seasons, days, and years". It says afterwards that God knew that what He had brought forth in the celestial domain was good, and it was for this purpose that He created them; for it would be false to think that this good could be accomplished through them by accident.

The evening and the morning of this stage of creation are unified; for all the heavenly bodies, [i.e., those that prevail in the night as well as those that prevail in the day] participate in the emanation of the plan, order, and rightness among existent things. Now evening and morning are evidenced amongst the heavenly bodies in two ways: (1) since any one heavenly body is such that different relationships to the visible part of the Earth result and the morning [of the body] is the time when its activity on this ^z visible part of the Earth is greatest, whereas the evening is the time when its activity is weaker, this [whole cycle] is unified, even though different activities emanate from it. ⁴⁶ (2) The heavenly bodies differ amongst themselves with respect to rank according to the activities that derive from them. Nevertheless, all of them are unified so that from their *entirety* this marvelous sub-lunar order is derived.

There are here two serious difficulties that must be resolved. First, we have already pointed out that God [may He be blessed] created these heavenly bodies ^{a1} for the benefit of sub-lunar things. This seems to imply that the superior is for the sake of the inferior, and this is an utter

⁴²Ibid, chap. 9.

⁴³Genesis 1:14.

⁴⁴Genesis 1:18.

⁴⁵Genesis 1:14.

⁴⁶An equilibrium is preserved amongst these contrary influences.

absurdity according to philosophers. ⁴⁷ Second, according to the natural scheme of things the creation of [the heavenly bodies] ought to have taken place on the third day; for the heavens and the heavenly bodies are causally and ontologically prior to the elements and that which is derived from them, [which were created on the previous days].

The first of these difficulties can be easily disposed of in the light of our previous results. For it is always the case that the superior perfects the inferior by its influence upon the latter. In this way God perfects all existent things. It would be false to say that because of this [influence] God exists for the sake of things inferior to Him. Rather, we say that His being is so perfect that it can impart this perfection to all existent things, to the extent that they can receive it from Him. What is absurd, however, is the [claim] that the superior acquires its perfection from the inferior. Accordingly, this difficulty can be resolved as follows. The heavenly spheres and their movers exist for themselves; [but] because it is more noble for a body, in so far as it is a body, to have some activities than not to have any activities -- for such activities are in a sense the "life" of a body; otherwise they would be dead bodies -- they were put into motion. Now since it is not fitting that they act for no purpose -- i.e., that they move but no advantage results from their movements (it being impossible for this advantage to accrue to themselves, since they have no element of potentiality in their essences) -- these activities have been given to them for the purpose of perfecting the rest of the universe. For this reason, the shapes of the spheres, their number, their illuminations, and all the other properties found in the heavens are in the best possible manner for the perfection of sub-lunar phenomena. Now it is obvious that this difficulty

is solvable only on the assumption that the universe is created. Hence, it can be proven from this phenomenon [i.e., the teleological structure of the universe] that the universe is created.⁴⁸

The second problem is, however, quite difficult; yet we shall try to solve it to the extent of our ability. Since it is the entire intention of our perfect Torah to lead its students who follow it to true happiness, as we have explained in our *Commentary to the Torah*,⁴⁹ the Torah^{b1} intended through this [particular] ordering of the account of creation to awaken^{c1} man through his reason to the secrets of existence. In addition, it intended to awaken man through his reason to the fact that the universe is created. It does this by making him pause. [Consider the following analogy.] The traveler who is confident that there are no obstacles in the path on

⁴⁷Maimonides, *Guide*, III:13.

⁴⁸Gersonides, *The Wars of the Lord*, Bk. 6, pt. 1, chaps. 7-9; *Commentary on the Torah*, *Genesis*, 12a.

⁴⁹Introduction, 2a.

-458-

which he is traveling does not think carefully about this path, so that sometimes this [confidence] causes him to fail to arrive at his destination -- indeed, it would have been better had he remained at home since he continually gets farther away from the place he wanted to reach; whereas if there had been an obstacle, he would have thought carefully about his path and attempted to remove the obstacle or he would have taken a different path to his destination. So it is with the Torah: if it included nothing that would make a person pause, he would not study the Torah carefully, and this would be the cause that prevented him from reaping its benefits. Indeed, the change in the ordering of the creation in this matter was precisely for this reason. For if the creation of the heavenly bodies had been mentioned before the appearance of the dry land, it would have been possible for someone to err on this matter^{d1} and think that the appearance of dry land was attributable to the influence of the heavenly bodies, as Aristotle and his followers believed.⁵⁰ Therefore, the Torah mentions *first* the appearance of dry land before it mentions the creation of the heavenly bodies. And since the Torah states that the appearance of the dry land is^{e1} not for itself but for the living things generated on it, it was necessary to mention with its [own generation] the generation of the plants. It was also necessary to inform [us] that the evening and morning in this stage of creation [i.e., the third day] are unified.

Moreover, if the Torah had mentioned the creation of the [individual] heavenly bodies [immediately] after the creation of the heavenly domain [i.e., the firmament on the second day], it would be possible for someone to believe mistakenly that the heavenly bodies [e.g., the planets] are in their spheres just for themselves and that the benefits^{f1} that derive from them to sublunar phenomena are by way of secondary intention. Hence, it interrupts [the sequence of narration and inserts] between the [second and fourth days] the creation of the visible part of the earth and plants in order to make us realize that the creation of the spheres was perfect without the heavenly bodies as far as their own nature was concerned; the heavenly bodies, on the other hand, are in them for the benefits that have been mentioned. The Torah thus leads us in this way to the acquisition of a proof for creation.

Furthermore, since along with the creation of the heavenly spheres the Torah also mentions God's divine creation of the elemental forms in the sub-lunar matter by virtue of which the latter is disposed to receive all forms, it would not have been proper to have ended the narration about the sub-lunar matter before telling something of the perfection it

⁵⁰Gersonides, *The Wars of the Lord*, Bk. 6, pt. 1, chap. 13.

is capable of having. Thus, it was necessary to mention the generation of plants and, consequently, the generation of the visible part of the earth, since the latter is in some measure the cause of the generation of these sub-lunar phenomena. After this the Torah completes its account of what was needed to complete the creation of the spheres, i.e., the heavenly bodies.

After completing its account of this level of creation the Torah begins to narrate the [next] phase of creation in the sub-lunar matter. It relates how God said that the waters should swarm with living creatures and that flying animals should be created to fly in the air in the firmament of the heavens. And so it was: God created in this fashion all species of fish found in the water that reproduce according to kind and all sorts of birds that reproduce according to kind. And God knew that what He had brought forth was very good with respect to the purpose for which He created them. Moreover, He created them in the best manner possible such that what we know of the good and grace with which He has created these things -- even if it is considerable, as is evidenced by the scientific account of the uses of limbs in animals -- is still quite small ^{g1} relative to the good and grace that is found in their natural constitution. God endowed them with the capacity to reproduce according to kind and blessed them so that they would reproduce and multiply; the fish would fill the water in the seas and the birds would be fruitful and multiply in the earth. Now the evening and the morning of this phase of creation were unified: the "evening" referring to the most defective form of animal life, i.e., the various species of fish, and the "morning" referring to a more perfect level of them, i.e., the various forms of birds. These two genera of animals needed to be blessed so that they would be fruitful and multiply, whereas the perfect animal did not need this blessing; for the type of reproduction found in these genera is imperfect, since in their own bodies they make eggs, either complete or incomplete ones. Therefore, they require additional divine providence for their reproduction to a greater extent than the ambulatory animals in order that the generation will be accomplished and their offspring will be preserved; for the ambulatory animals produce live organisms in their bodies. This providence given by God is an instrument through which this imperfect method of reproduction is perfected. Man, however, does not need this blessing in order to be fruitful and to multiply, since his method of reproduction is perfect. But [the blessing that is given to him] is by way of a commandment, i.e., God commands him to be fruitful and to multiply so that his species will not be destroyed. We have already explained this point quite clearly in our *Commentary on the Torah*; hence, there is no need

here for further discussion. [51](#)

With this phase of creation completed the Torah then describes the next step in creation. It is stated that God said that the earth should ^{h1}bring forth species of walking ⁱ¹animals that reproduce their species. And so it was; i.e., God made all kinds of non-rational walking animals in this way. God knew that what He had made was good, since He made it in the most perfect way possible in so far as He fashioned these animals in a way best suited for the realization of what He intended.

Then God said to the upper and the lower creatures that He will make from them man, a creature with reason. [52](#) God says in addition that man will be so created that he will rule over all living creatures in the world of generation and corruption. And so God did; i.e., God created man in

this way with the human form especially ascribed to him, i.e., the material intellect. Thus, God created him to some extent in the image of the celestial creatures; since the latter are beings with intelligence; hence, human reason is similar in some respect to the reason of these higher beings. Now God created man as male and female; for otherwise reproduction would not be achieved. We should understand that in the divine creation of the other animals they too were created in this way. God blessed them [i.e., the human species] for the purpose of sustaining and preserving them, saying to them that they should be fruitful, multiply, and fill the earth and possess it. All of this is necessary for man for the preservation of his species. For if the human species were concentrated entirely in one particular part of the earth, it would perish when some kind of catastrophe would occur in that part of the earth, as has been explained in part 1 of this Book. ⁵³ For this reason it was necessary that languages be different, as we have explained in our *Commentary on the Torah*. ⁵⁴ In the very day that God created man He gave him the power to rule over "the fish in the sea, the birds of the heavens and every living thing that moves upon the earth". ⁵⁵ Since all animals exist for the sake of man, it was necessary that man have dominion over them; otherwise man would not receive from them the benefits for which these animals were created.

Then the Torah states that God said [to the human species]: "Behold, I give to you the nature and capacity whereby all vegetables and fruits

⁵¹ *Commentary on the Torah, Genesis, 12a.*

⁵² *Bereshit Rabbah, 12;8*

⁵³ Gersonides, *The Wars of the Lord*, Bk. 6, pt. 1, chap. 15.

⁵⁴ *Commentary on the Torah, Genesis, 21b-22a.* The dispersion of the descendants of Noah and the development of different languages, as recorded in Genesis 11 are interpreted by Gersonides as providential: had it not been for the geographical and linguistic diversity of the human species, this species would have been destroyed.

⁵⁵ Genesis 1:28.

that reproduce according to seeds are proper foods for you". ⁵⁶ This came about in so far as God gave man the power to transform these things when he is nourished by them and to turn them into his own substance. ⁵⁷ Similarly, God gave to all the genera of terrestrial animals the appropriate nature and capacity for nourishment from green grass; i.e., the leaves of plants and trees are also proper nutriment for them. ⁵⁸ When God willed that this be so, it was as He wished. This creation is mentioned here because by means of it all these species are sustained and preserved as long as possible. God knew that all He did was very good for [the purposes] He intended; hence, He created them in the most perfect manner possible. This point is implied in the phrase "all that He made"; ⁵⁹ for whatever He made in the sub-lunar world is such that some part is for the sake of another part, and the good is not achieved until it arrives at the goal for the sake of which that which preceded the goal exists. And so, the complete good of the whole universe is never achieved until it exists completely and perfectly. The evening and the morning in this phase of creation were unified; i.e., the non-rational and rational animals [were unified into one system of nature], since some of them are the perfections of the others. In this way it is demonstrated that all the parts of the world constitute a unified [system]; and in this unification the whole world is like one man. In this marvelous narrative the Torah ⁶¹ informs us of a principle upon which all natural science is based: nothing in nature is in vain. This is what is ^{k1} made known by the statement that everything which God made of these beings is *very good*. ⁶⁰

It should be noticed that in the creation of man it is said, "let *us* make man", using the plural, whereas this is not the case in the accounts of the other generations (e.g., "Let *the earth* bring forth grass", "Let *the water* swarm", "Let *the earth* bring forth"); for the other creations do not have a non-corporeal form. Accordingly, their generations are ascribed to the elements together with the power then given miraculously by God to them, so that from these elements the generations will take place. With respect to man, however, since he has in some sense a non-corporeal form [i.e., reason], his generation is not ascribed to distinct elements [e.g., earth or water]; rather, the generation of his matter is ascribed to the elements, whereas the generation of his separate form [i.e., his reason] is [ascribed] in some sense to the higher [intelligences]. As it is

⁵⁶Genesis 1:29, as Gersonides interprets it.

⁵⁷*è tzem ha-nizon*; literally, "the substance of the one nourished".

⁵⁸Genesis 1:30.

⁵⁹Genesis 1:31.

⁶⁰Genesis 1:21.

said ¹¹: "And the spirit returneth unto God who gave it." ⁶¹ Thus, our Sages (of blessed memory) have said in many places that man is created from the celestial and terrestrial creatures. ⁶² All this indicates that man has an intellect by virtue of which he is similar to the higher creatures, [i.e., the separate intelligences]. Now ^{m1}, since the Torah describes here in brief the creation of man in order to complete its account of the creation of the world, it then describes the secrets of the creation of man and the instruments ⁿ¹ which God gave him so that he can attain spiritual happiness, as we have explained in our *Commentary on the Torah* in the discussions about Adam and Eve, the serpent, the Garden of Eden, the Cherubim, and the flaming and rotating sword. This is not the place for such an inquiry; for our intention here is to explain the Biblical account of the creation of the *world*.

It should be realized that the Torah explicitly mentions in this section that the acquired intellect is everlasting. It says that man "became a living soul"; ⁶³ that is, there is a difference between the human soul and the souls of the other animals: the human soul has the power to be living and self-subsistent, ⁶⁴ a power that is lacking in other animals. Indeed, you

⁶¹Ecclesiastes 7:12.

⁶²*Bereshit Rabbah*, 12:8.

⁶³Genesis 2:7.

⁶⁴*Qayyamet be-'atzmutah*. Staub translates this phrase as "endures in itself" (Staub, *Creation of the World*, 278). Already in Rabbinic Hebrew the term *qiyyum* and its Aramaic cognate connoted "permanence" [See M. Jastrow, *Dictionary of the Targumim, the Talmud Bavli and Yerushalmi, and the Midrashic Literature*, (New York, 1950)]. Maimonides used this term to explain the attribution of the term '*amidah*' ("standing") to God: the latter term in reference to God always connotes permanence. In this present context Gersonides is concerned with the immortality of the acquired intellect, i.e., its permanence, or everlastingness, which doctrine he proved in Bk. 1, chaps. 11 and 13 (see also Bk. 5, chap. 12, where he attributes *qiyyum* to God). The term *be-'atzmutah* is more complicated. The term '*atzmut*' or '*etzem*', is a technical term in medieval Hebrew philosophy usually connoting "substantiality" or "essence". Gersonides himself uses this term in this sense in Bk. 3, chap. 3 and in Bk. 5, pt. 3, chap. 12 (Maimonides, *Guide I*, chaps. 52, 53; II:30. Touati, *La Pensée*, 118, 120; *Les Guerres du*

Seigneur, 76, n.3). However, with a pronomial suffix (e.g., 'atzmuto), the term can connote "itself". For example, The Wars Bk. 5, pt. 3, chap. 12, the First Cause is described as knowing itself (maseget 'atzmutah). Actually, both these connotations are just the "two sides of the same coin": in so far as something knows itself it knows its essence, and conversely. (For Arabic equivalents see Goichon, Lexique, pp 265-68).

The Hebrew term bèatzmut seems to correspond to a set of three phrases commonly used in Platonic, especially Neo-platonic, philosophy: (1)καθ' Ὀυσίαν (2)καθ' αὐτό; (3)καθ' ἑαυτὸν. Phrases 1 and 3 are usually rendered as "according to substance (essence)". Phrase 2 is commonly translated as "in itself", "in virtue of itself", "in its own right" (J. Barnes, "Immaterial Causes", Oxford Studies in Ancient Philosophy I, (1983), 174, 188. H. Davidson, Proofs for Eternity, Creation, and the Existence of God, 294 n.79). It corresponds to the Rabbinic phrase be'atzmo (Jastrow, ad locum).

All these expressions connote the idea of something that is capable of independent existence, something that exists as such, unlike an accident, which must inhere in a substance. In this context the term be'atzmut is used in both of its connotations to refer to a substance whose nature is such to be "self-subsistent" i.e., it exists through its own essence, or by itself. As such it is permanent and enduring. One example of such a substance is the acquired intellect -- the human intellect in its perfected state, constituted (hit'atzmut) by its knowledge, which in turn derives from and is based upon the knowledge of the Agent Intellect, which is permanent and everlasting.

-463-

will not find any other kind of soul described as "living" [*hayah*]. In the sentence "Let the earth bring forth the living creature after its kind" ⁶⁵, the term "living" is not an adjective describing the soul but a generic term denoting a certain genus of living beings, i.e., animals. This is obvious. In short, the description of man as a "living creature" teaches us the uniqueness of the human soul amongst the souls of all animals. And to indicate this basic [truth] it is said also that man was created in the image of the higher beings. Afterwards the Torah explains how the human soul is self-subsistent: it relates that it is man's nature ^{o1} to give names to all animals, names that indicate the essences of these creatures, and this is indicated by the definition [of the name]. The meaning of this passage is that man has the capacity ^{p1} to apprehend the essences of these things. And it says that whatever name man called the animal in this way, its name is a "living creature", i.e., the conception of that essence is a selfsubsistent intellect. ⁶⁶Note how the Torah explains the immortality of the acquired intellect and how in addition it indicates to us ^{q1} that human happiness consists in the conception [of these essences] and not in judgment, [or verification], in so far as it is [mere] judgment; rather, happiness accrues to judgment [only] in so far as it ^{r1} is [i.e., involves] conception, as has been explained in Book 1. ⁶⁷Indeed, the Torah indicates ^{s1} this to us since the giving of names to things is an act of conception and not judgment, as is obvious. The Torah took here [as examples] the various genera of animals amongst all other natural phenomena of terrestrial ^{t1} existence, since animals are more noble than other natural things; e.g., elements, homogeneous parts, and plants. Now the happiness attained

⁶⁵Genesis 1:24.

⁶⁶Genesis 2:20. To understand this point one should recall Gersonides' doctrine of the acquired intellect developed in Bk. 1, chap. 10. According to this theory the intellect and its object are identical in the act of cognition. Since the objects of the intellect are permanent in so far as they are established in the Agent Intellect, the acquired intellect is immortal in its apprehension of these objects (cf. *Commentary on the Torah, Genesis 14a-b.* Touati, *La*

Pensée, 438-40).

⁶⁷Gersonides, *The Wars of the Lord*, vol. 1, Bk. 1, chap. 10, pp. 186-88. According to Aristotle, the apprehension, or conception [*tziyyur*], of essences is epistemologically and logically prior to the formation, assertion and verification ['*immut, ha'amatah*] of judgments consisting of them (Aristotle, *On the Soul, III:6*). This became standard medieval doctrine (Aquinas, *Summa Theologiae, I*, question 85, article 6. Ockham, *Philosophical Writings*, ed., L. Boehner (Indianapolis, 1965), II:1).

-464-

by man through apprehension of the more noble things is greater, as we have indicated in Book 1. See how the Torah is explicit on this point. Our predecessors were not unaware of this point; but because of their blindness, brought about by the views of the philosophers on the immortality of the soul, they committed a grievous error in saying that the Torah does not teach the topic of spiritual happiness [i.e., immortality of the acquired intellect]. Indeed, the Torah begins by mentioning this doctrine. Otherwise there would be no point in the guidance^{u1} that it gives us for the perfection of the soul through the use of reason, whose goal is apprehension alone; rather the effort would be otiose. Hence, the Torah had to inform us at the outset about the immortality of the soul; for it is the goal towards which everyone who pursues spiritual perfection should strive.

The explanation of the account of the stages of creation at the moment of the creation of the world has now been completed. And since there is [actually] a seventh stage, God attributes [it] to the creation of the world, i.e., His continuous preservation of it in the way that it is. ⁶⁸This activity [i.e., the creation of the world] is not like the work that we do by means of a skill which does not require the existence of the craftsman after its completion; rather, it continually requires an agent that sustains^{v1} and preserves it. The nature of this divine sustenance is that God continually apprehends Himself [i.e., His essence]. This is the case in so far as He continually has an extraordinary desire for this most noble of apprehensions.

⁶⁸This sentence is syntactically complex and monstrous in size, as it extends throughout *twenty* lines in the Leipzig text. For the sake of simplicity I have broken it up into several sentences, altering some of the wording.

The problem Gersonides addresses in this closing section of this chapter is the meaning of Genesis 2: 1-3, where God is described as having brought to a close His creation of the world and having then rested, thus introducing the Sabbath as the crown and consummation of creation. The wording of these Biblical verses is, however, difficult. Why does Scripture say in Genesis 2:2 that God "finished" creating when it says this in Genesis 2:1? In fact, if God rested on the seventh day, how could He have completed his work on the seventh day? The two clauses of Genesis 2:2 seem to contradict each other. Finally, the wording of Genesis 2:3 is awkward: "for on the seventh day God rested from *all His work which He created to do*". The last phrase is not smooth. Gersonides now undertakes to clean up these questions (see E. Speiser's comments on this passage in his translation of Genesis in the Anchor Bible series).

Nor was he the first to sense these difficulties. The Rabbis record that the translators of the Septuagint altered the Hebrew text to make it more comprehensible to King Ptolemy, for whom the translation was supposedly made, and changed the text to read: "And God finished on the *sixth* day His works which He made, and He ceased on the seventh day from all his works which he made. And God blessed the seventh day.... because in it He ceased from all His works which God began to do" (*Bereshit Rabbah 10:9; B. Megillah 9a*). This "straightening out" in the Septuagint is also found in the Samaritan Pentateuch. However, no

such option was available to commentators who adhered to the traditional Hebrew text, such as Gersonides. He had to find another way to make sense of this passage (see the Commentaries of Abraham ibn Ezra and Abravanel).

-465-

And by virtue of the extraordinary desire that is naturally occasioned by this most noble of apprehension [i.e., self-knowledge], the movers of the heavenly spheres [i.e., the separate intelligences] desire that what is to emanate from them to the terrestrial domain emanate continuously. For it would be absurd ^{w1} [to maintain] that this extraordinary desire necessarily stems from the inferior plan in their [own] minds. Rather, this extraordinary desire stems from their realization that their defective plan is part of the perfect plan in God. Because of their desire for [apprehending] the plan in the divine soul the movers of the spheres subject themselves [to God so as] to move their spheres continuously in such a way that the plan for the sub-lunar domain emanates from them. If it could be imagined that this subjection to God in this matter were to cease for one moment, all things in the sub-lunar world would be destroyed; for this subjection is the cause of the motions of the spheres being continually what they are. Moreover, when they conceive of themselves [i.e., their own essences and realize] that their very being, as well as that of the spheres and of the heavenly bodies to which they are conjoined, emanates from God in this extraordinary manner, they desire to emulate God as far as possible. In this manner they desire ^{x1} to influence that which is inferior to them in order to bring to fruition the divine intention according to which God had created them in this marvelous manner. And thus the Torah says that the creation of the heavens and the earth, and everything therein, was completed [Genesis 2:1] and that the seventh phase of creation is that God desired the work He had done, i.e., the rational [plan] of this work, which is the plan, order and rightness of existent things. In this manner God causes the universe to continue to exist. Nor is it necessary for Him to perform in the world all the activities ^{y1} that He had done in the moment of His creation of the universe; for He had already endowed existent things with a nature for continued existence in the way that they are, in so far as the movers of the sphere continuously have the desire to subject themselves to God [and] to move their spheres in the way that brings about the realization of the [divine] plan for the sub-lunar domain. And it is for this reason that God blessed and sanctified the seventh day when He gave the Torah to Israel, in order to indicate [to them] the fact of creation. ⁶⁹For in this seventh phase of creation God ceased from doing the sort of activities that He performed when He created the universe, and it [i.e., all the work of the six "days" of creation which God now ceased from doing] is the work which God created in order that the continued existence [of the world] be done

⁶⁹In the first formulation of the Ten Commandments in Exodus 20 the Sabbath is the symbol of creation.

-466-

according to the nature which He had given it at the moment of creation. ⁷⁰

Now, we have interpreted the phrase "*vayekhal 'elohim*" (Genesis 2:1) as meaning desire, as in the phrase "*vatekhalDavid*" [i.e., "and David desired"]. ⁷¹If someone were to object that if this [analogy between these two phrases] holds, the word "soul" is missing [in the former as it is missing in the latter]; for the activity [of desiring] is always connected with a soul as in the phrase, "my soul yearns and desires [*kalta*]. ⁷²Similarly, in the phrase "*vatekhalDavid*" the meaning is equivalent to "the soul of David desired". ⁷³We reply as follows: This is true when the person having the desire is a composite of body and soul, e.g., man. In this case it would be

proper to attribute the desire to the soul, to which part it would be [appropriate] to attribute desire and longing. God, however, has no [special] part to which desire can be uniquely attributed, since He is not a composite [entity]. Hence, the desire that He has is attributed to Himself, not to a part of Him, [i.e., the soul].⁷⁴

⁷⁰I am not sure of the translation of this sentence, and perhaps the problem is "genetic". The original Hebrew of Genesis 2:3 -- *Ki bo shavat mikol melakhto "asher bara" 'elohim la'asot* -- is not the most transparent; for the last word seems to be redundant. The new *JPS* translation renders it as: "...on it [i.e., the seventh day] God ceased from all the work of creation which He had done." According to Gersonides, on the seventh day -- the shabbat -- there was no new divine creative activity at all. All of God's "work" was manifested in the initial six "days", or stages, of creation, in which the natural order is permanently "programmed into the system", such that no further divine work is needed. The seventh day is a day of "rest" in the sense that God contemplates, desires and takes joy in the "rational order", or plan of the universe.

Gersonides' text is itself difficult because it is not clear what the antecedent of "*vehi*" is in the second clause of this sentence:



I have taken it to refer back to the work (*ha-pe`ulot*) of the six days of creation. In the word "



" assumes the role of the conjunction "in order that", analogous to the Latin '*ut*' or Greek '*iva*' (Touati, *La Pensée*, 284).

⁷¹Having given his philosophical interpretation of Genesis 2:1-3, Gersonides now attempts to support it philologically. The verb *va-yekhal* in Genesis 2:2 does not mean, as most have understood it, "finish"; rather, it connotes desire, as in the phrase "and David yearned for Absalom" (II Samuel 13:39). Thus, Genesis 2:2 should be translated as "And God desires.....the work He has brought about" according to the rational plan in His mind, which on the seventh day He contemplates and rejoices in.

This interpretation of "*va-yekhal*" has Rabbinic antecedents, as was noted by Abravanel in his commentary on Genesis 2:1-3 (See *Targum Yerushalmi*, *Genesis* 2:2). It was also adopted and given a mystical twist by a later commentator on the Torah, Jacob ibn Attar in his classic commentary *Or Ha-hayyim*

⁷²Psalms 84:3.

⁷³The objector argues that since in the phrase "*vatekhal*David" the term *nefesh* is understood as the subject of the verb *vatekal*, which is feminine, as is *nefesh*, the same should be true in "*vayekhal 'elohim*" i.e., the subject should be *nefesh*, and the verb should be *vatekal* and not *vayekhal*, which is masculine. Hence, there is no analogy.

⁷⁴Thus, the verb in Genesis 2:1 is appropriate, and Gersonides' interpretation is not deflated by this grammatical point.

One could interpret the phrase "*vayekhal 'elohim beyom hashevi`i melakhto 'asher `asah*" (Genesis 2:2) as meaning that God completed in this seventh phase of creation His work that He had done in so far as He continually bestows upon the movers of the spheres submission to Him by virtue of His superior level of being, which is the cause of their continuous desire^{z1} for Him.

Because of this [desire] they move their spheres in the marvelous way ^{a2} by means of which the realization of the plan for the sub-lunar world is achieved. Indeed ^{b2}, either interpretation makes the same point. Nevertheless, the latter interpretation is, I believe, more fitting. ⁷⁵ Now this seventh phase is the most continuous, [i.e.,] it never ends or is interrupted, as we have explained in our discussion of the indestructibility of the universe. ⁷⁶

This is the extent of what we intended to explain ^{c2} of "the works of creation" in this place. It is identical with what philosophy has taught us with respect to the creation of the universe. And it is fitting that this is so; for it is impossible that the Torah lay down for us a false doctrine. Hence, it is necessary for the Torah to agree with what is demonstrated by philosophical proof. You, my reader, notice how remarkable our explanation of this chapter [of Genesis] is compared to those of our predecessors, such that no other interpretation but ours is even possible! Our reader should not misunderstand us; for this chapter clearly testifies in our behalf, whether by means of its language or its order, that this is its true explanation. We did not want to lengthen our discussion by refuting the interpretations of our predecessors, since we believe that this would be a superfluous undertaking in the light of the transparent truth of our own interpretation and the clear indication of Scripture itself thereof. And with the confession of the opposing party there is no need for witnesses. ⁷⁷

It is proper that we give great thanks to God for revealing ^{d2} to us this

⁷⁵In this second interpretation Gersonides follows the traditional explanation of the verb "vayekhal" as "finished", "completed". But since he interprets the completion as the perpetual subjection of the separate movers to God, by virtue of which they continually desire to move their spheres, this second interpretation incorporates also the first interpretation's rendition of "veyekhal" as desire. For this reason Gersonides claims that the two readings of this verse amount to the same point. In the *Commentary on the Torah, Genesis*, Gersonides mentions this second interpretation briefly but expresses no special preference for it (13c).

⁷⁶Gersonides, *The Wars of the Lord*, Bk. 6, pt. 1, chap. 16.

⁷⁷Scripture is in this metaphor a litigant along with philosophy. Since the former agrees with the claims of the latter on this matter, there is no point in bringing further evidence, which in this case would mean bringing the other interpretations and showing by "cross-examination" their "unreliability". In the *Commentary on the Torah, Genesis*, Gersonides is a bit more respectful to his predecessors, two of whom he mentions by name, Maimonides and Abraham ibn Ezra. (13d).

extraordinary account [of creation] that has enlightened ^{e2} us. [Indeed], it was the cause of our having found the truth on this topic, [i.e.,] through this extraordinary guidance ^{f2} we have been brought to the truth of this matter, ⁷⁸ as we have indicated.

⁷⁸The phrase "



" is difficult, especially the sequence of prepositions, "



". A verb is needed between



. I suggest the emendation:



-469-

CHAPTER IX

AFTER having indubitably demonstrated that the world was created after having been non-existent, and since it is evident that the miracles, whose occurrences are well-known from the Torah and the Prophetic writings, were of this type of generation [i.e., the free act of God] in some sense -- for that which is generated in a miracle is not generated from a determinate thing [from which it must occur], as in the case of natural processes -- it is now proper to investigate the nature of miracles, their purposes, the things from which they could occur, and the agents of their production. When we have obtained knowledge about these features of miracles, we will have acquired the information of them that has been desired. It is obviously proper that we begin here with a discussion of what is known to us about miracles from the stories in the Torah and Prophetic books, so that we can extract from them a proof of that which we want to examine about them, just as in speculative matters we begin with empirical data within the domain of our inquiry in order to extrapolate from them a premise for a proof of that which we want to know. Some things are such that a person can understand them by means of his own sense-observations, which because of their accessibility to the senses [afford access] to what he needs for the completion of his inquiry. Other things are not capable of such an easy empirical proof; they require that the investigator employ the observations made by other authoritative scientists, as did Aristotle on the various species of animals and Ptolemy on the aspects of the heavenly bodies. They frequently employ the data of their predecessors because of the extreme difficulty of obtaining the necessary observational data for these inquiries; were it not for the help afforded by their predecessors, [they would not have succeeded in their own investigations]. It is evident that the case of miracles is of this sort. For we [ourselves] have not observed them such that we could derive from them a premise for a proof in this subject. Hence, we must accept these data from predecessors who, we believe, are trustworthy. They are all the Prophets and the men living in their days to whom these facts were well-known and indubitable. ¹

¹Gersonides makes an analogy between his inquiry into miracles and the methods employed in the empirical sciences: just as the latter are based upon sense-observations made by competent observers whose observations are accepted by the scientific community, so too our belief in miracles is based upon the observations of people in whom the religious community has complete trust, i.e., the Prophets and the people who witnessed their deeds.

The argument for the reliability of tradition is an old one. It was used by Saadia and Halevi (Saadia Gaon, *The Book of Beliefs and Opinions*, III:6; J. Halevi, *The Kuzari*, Bk. I:25 and 65). But Gersonides adds the analogy with the sciences, showing that those who believe in miracles on reliable evidence, even if it is not of their own making, are no worse off than those who believe today that a solar eclipse occurred on July 11, 1989 B.C.E. For just as the latter rely upon the trustworthiness of those who reported this event, so do the former.

The significance of this argument can be appreciated when we turn to David Hume who discounted the appeal to reports of miracles on the grounds that the reporters were "ignorant and barbarous" (D. Hume, *An Inquiry Concerning Human Understanding*, Section X, part 2). But suppose the reporters are not ignorant and barbarous? Wouldn't it then be an evident bias to reject their testimony? And how do we know that they were ignorant? Hume would have to

do better to counter Gersonides' argument.

-470-

When we examine the [different examples] of miracles we see that some of them concern substances, whereas others are examples of accidental occurrences. Examples of the former are the turning of the staff into a snake and the water into blood, etc. Examples of the latter are when Moses' hand became leprous for a time without any prior causes that would naturally bring about leprosy; ² and when Jeroboam's hand withered when he commanded that the prophet, who had prophesied the destruction of the altar upon which Jeroboam had committed idolatry, be seized. ³ It is also evident that in the cases of some miracles the prophetic revelation about them is given to a prophet before they actually occur, whereas in other cases there is no such revelation. Of the latter type there are two kinds: (1) when it is clear that the prophet prays to God (may He be blessed) that He perform a particular miracle; and (2) when it is not clear that [the prophet prayed] but it is recorded only that the prophet decrees that a miracle shall occur and that the miracle does occur according to his decree. An example of a miracle whose [imminent] occurrence is revealed to the prophet is the case of all the plagues which God brought about in Egypt, and [there are] other miracles of this type. Examples of a miracle that is unannounced but it is related that the prophet prayed to God to bring it about are when Elisha prayed that God blind the people who were pursuing him, and when Elijah prayed to God that He bring to life the widow's son. ⁴ There are other examples of this type. Examples of an unannounced miracle which the Prophet merely decrees and it so happens are when Elijah says, "If I be a man of God, let fire come down from heaven and consume thee and thy fifty"; ⁵ and the miracle of the oil performed by Elisha, ⁶ as well as others of this kind. Moreover, an inductive examination of the miracles reveals that all of

²Exodus, 4: 3-4, 6-7.

³I Kings, 13.

⁴II Kings, 6:18; I Kings, 17:17-24.

⁵II Kings, 1:10.

⁶Ibid., 4:1-7.

-471-

them are ascribed to a prophet. Further confirmation of this inductive inference is given in the Torah; when Moses asked God for a proof that would verify to the people of Israel that God had indeed appeared to him, God commanded him to perform ^b certain signs in front of the people so as to convince them that he is a prophet. If it had been possible for these signs to have been performed without a prophet, they would not have served as proof that he was a prophet. Nor is the miracle performed in behalf of Hezekiah a counter-example of this claim: when the angel of God smote the camp of Assyria Isaiah was present and in fact announced this plague to Hezekiah. ⁷ Indeed, when God caused the Arameans to hear the sound of chariots and horses [so that] they fled their tents because of this, Elisha was present, and he announced this miracle when he had said, "Tomorrow about this time shall a measure of fine flour be sold for a shekel and two measures of barley for a shekel in the gate of Samaria." ⁸ Similarly, when God caused all the women of the house of Abimelech to be barren and afflicted Pharaoh with all kinds of serious diseases because of Sarah, Abraham was present and he was a prophet. In short, an investigation of the Torah and the Prophetic books reveals that all miracles recorded therein are either performed by the prophet or for his benefit; indeed, none of these miracles occur without some connection with a prophet.

Moreover, an inductive analysis of the miracles shows that all of them are expressions of beneficence, grace, and providence: either for the purpose of bringing about right belief, material benefits, or salvation from evil, whether spiritual or material. Examples of miracles that brought about right belief are the signs that Moses performed so that the people of Israel would believe in his prophetic mission and in God, and the miracle performed by Elijah to convince the people that the Lord is God. There are others of this sort. Examples of miracles bringing material benefits are the Mannah brought about by Moses (may he rest in peace) and the miracle of the handful of meal in the jar and the little oil in the cruse performed by Elijah.⁹ There are others of this sort. Examples of miracles that saved the people from evil are the splitting of the Sea of Reeds and the angel of God smiting the Assyrian camp, etc. The case of the earth's swallowing of Korah and his company (as well as other miracles of this sort) is not a counter-example to this rule; for this is also an expression of [divine] goodness for and providence over Israel, so that the people would be humbled into obeying the words of God as conveyed through

⁷II Kings, 19.

⁸Ibid., 7:1. (This is not an exact quotation).

⁹I Kings, 17.

-472-

Moses His servant. An examination of all the other miracles will reveal that they are intended for some good. This is necessarily so. For the miracles are necessarily derived from an intelligence, since through them substances are generated (as we^d have mentioned); and the giver of forms is itself a separate form, as can be demonstrated from things generated by crafts, and the form is the source of good only, whereas matter is the source of evil, as has been explained previously.¹⁰

¹⁰Gersonides, *The Wars of the Lord*, vol. 2, Bk. 4, chap. 2, p. 163, n.11; Appendix, pp. 242ff.

-473-

CHAPTER X

NOW that we have made these preliminary remarks about the nature of miracles, it is necessary to consider the question, who is the agent of these miracles? For it is impossible that they not have an agent. Since all of them have some good purpose, and this is itself one of the characteristics of the activity of an agent as such (as already has been proven),¹ it is clear that these miracles must be derived from some agent. Moreover, in some miracles animals are generated, e.g., the generation of a snake from a staff; and it is utterly absurd to claim that the animal has been generated by chance or spontaneously, especially in the light of its perfect and marvelous structure. Furthermore, the occurrence of miracles is announced by a prophet; this would be impossible if their occurrence were simply accidental and fortuitous. This is quite obvious from what we have proven in Book 2. Accordingly, since miracles are the outcomes^a of the activity of an agent and since these activities belong to the class of activities that are generated in the terrestrial domain such that the law, order, and rightness of these latter phenomena includes them [i.e., the miracles] -- the skill, for example, that is involved in transforming the staff into a snake requires knowledge of the order and plan, [i.e., nature], of the snake, just as its production from its species requires this knowledge,² -- it^b is evident that the agent who performs these miracles possesses some knowledge of the plan, order and rightness of terrestrial phenomena.

If this is the case, the following disjunction must hold: either God is the agent, since He has knowledge of the law of the universe (as has been explained); or the agent is the Agent Intellect, since it too has knowledge of this law for the sub-lunar world; or the agent is a prophet, who also has some of this knowledge. It is obvious that there is no other kind of agent to whom this activity can be attributed. For it is impossible to claim that *one* of the movers of the spheres is the agent, since these activities [involved in the miracles] are examples of those activities in whose occurrence *all* the movers participate. And it is impossible to attribute their generation to another intelligence besides those [previously mentioned], as shall become evident from our subsequent discussion. Now,

¹Bk. 6, pt. 1, chap. 6.

²Gersonides is alluding here to his discussion of the role of the Agent Intellect in the reproductive process (Gersonides, *The Wars of the Lord*, Bk. 5, pt. 3, chap. 1).

-474-

since we possess few true premises on this subject and they were acquired with great difficulty -- it was even more difficult because none of our predecessors was any help to us on this topic -- it will be necessary for us to begin by presenting all the premises that in our opinion are used in establishing any of these alternatives or in refuting them. This method will yield many premises, and it will be easier for us to select the true from the false premise, as Aristotle has suggested in the *Topics*.³ In addition, this method will lead us to the truth on this question such that no doubts will remain. For contrary views on a question produce difficulties concerning that question; and if the truth has been demonstrated on that question but the known contrary views have not been demonstrably refuted, we are still perplexed by this topic, and true knowledge on this question^c is still not in our possession. For perfect knowledge of a thing is attained when no doubts about it remain, as Aristotle points out in the *Metaphysics*.⁴

Now for each of the [aforementioned three] alternatives there are several arguments. [Let us consider them in turn]. [First], it would seem that the generation of these miracles should be attributed to God, since their generation belongs to the type of voluntary generation, which has been attributed to God in the creation of the universe. This is quite^d obvious, [as we can see] from the nature of their generation. [Second] since God ordered the whole scheme of nature, it is not proper for anyone in nature to have the power to change nature and its order except God, Who made this nature [in the first place]. This is analogous to the case where a king ordains certain laws according to which and by virtue of which his subordinates rule his subjects. It is clear that not one of his subordinates should have the power to change this law. Only the king has this power, since he established this law [in the first place]. This analogy is supported by the fact that all the miracles recorded in the Torah and the Prophetic books are attributed to God. This is quite evident. Finally, some of our Rabbis (of blessed memory) seem to maintain that God is the agent of all miracles. Thus, they have said concerning the plague of the first-born sons: " 'I have passed through the land of Egypt', i.e., I [the Lord] not an angel, etc." ⁵

³Aristotle, *Topics*, 1:2, 101a 35-37.

⁴Aristotle, *Metaphysics* I:1-2. Although there is here no explicit reference to the problem of doubt, Aristotle's claim that knowledge exists when we have knowledge of the causes of things is tantamount to the view that in perfect knowledge there is no doubt. For to know the cause is, for Aristotle, to know why a thing or state of affairs must be the case. But if we have this type of knowledge, we have no longer any doubts about the matter.

⁵*Passover Haggadah; Mekhilta VII.*

In behalf of the thesis that the Agent Intellect is the agent of miracles there are the following arguments. [First], since communication through prophecy occurs via the Agent Intellect, as we have proven in Book 2, it is evident that the Agent Intellect knows of the occurrence of these miracles and accordingly communicates this knowledge to the prophet. Hence, it is evident that the Agent Intellect is the agent of the miracle. For if their occurrence were attributed to God alone according to his will, the Agent Intellect could have no knowledge of them, since their occurrence would not be lawful and orderly such that knowledge of them would be possible. In short, since a Separate Agent performs its actions because of its knowledge of the law [of the universe], and since the Agent Intellect has knowledge of the occurrence of these miracles, it is proper that it be the agent of these miracles. Our claim that the miracles have a determinate law [means that] without this law there would be no communication [to the prophet] about them; for communication is about determinate and ordered phenomena in so far as they are determinate and ordered, as has been explained in Book 2. Moreover, it is impossible for a Separate Intellect to have knowledge of particulars as particulars. Hence, there must be a general law to the miracles; and knowledge of them is attained by the prophet by means of a particular sign in the manner described in Book 2 concerning the attainment of knowledge of particulars from the Agent Intellect.⁶ [Third], these actions [i.e., miracles] are all concerned with things in the terrestrial domain over which the Agent Intellect has [direct] control. For example, after the creation of the world you will not find any new heavenly bodies that are miraculously created. An examination of all the miracles, whether of the substantial or of the accidental types, reveals that they are all within the sub-lunar world. Accordingly, it is proper that their agent be the Agent Intellect. [Fourth], since the occurrence of miracles is for the providence for and benefit of the sublunar world, and since the Agent Intellect is that which bestows this providence in the most perfect way possible, it is proper to attribute this providence [i.e., the performance of miracles] to the Agent Intellect. For if this latter providential activity were attributed to another intellect, then since this providence would in some sense be the perfection of the providential activity bestowed by the Agent Intellect upon the sub-lunar world, it would follow that this second intellect would know the plan in the Agent Intellect from which this providential influence upon the sublunar world emanates. For it is obviously impossible for it to know that which perfects a thing and not to know that of which this is the perfection. But if this is the case, it would follow that this second intellect is the

⁶Gersonides, *The Wars of the Lord*, vol. 2, Bk. 2, chap. 6, first difficulty.

agent of things in the terrestrial domain, since it has complete and perfect knowledge of the plan according to which the existence of these things emanates. And it would be natural for these activities to be derived from it, [and not the Agent Intellect]. [Since this conclusion is false],⁷ it is evident that the Agent Intellect is the agent of these miracles.

[On the other hand], there is an argument in behalf of the thesis that man is the agent of these miracles. Since the will, which is [on this hypothesis] the cause of the origin of the miracle, is itself generated, and since it is impossible to attribute a generated will either to God (may He be blessed) or to the Agent Intellect, whereas it is possible to attribute such a will to man, it [may be thought] appropriate that man be the agent. This would be possible when he knows a great deal of the law of the sublunar world; and by virtue of the law apprehended in his soul he attains, in a sense, the level of the Agent Intellect. Then he would be capable of performing actions that can be attributed to a separate [intellect], and a generation of the will occurs to him because he is

attached to matter. This point can be [better] understood if one considers the readiness of the specific matter to be affected by its specific form. [For example, a bashful person easily becomes reddened because of his mental sensitivity to embarrassment. In general, the susceptibility of the specific matter to its specific form is quite remarkable, as we have already pointed out. In this manner it is possible to conceive of a man whose form [i.e., his mind] comprehends in some sense sub-lunar phenomena, such that they are affected by him according to his will. These phenomena are all, [with respect to his will], like the [susceptibility] of the specific matter to [its] specific form. This comparison is supported by what we know of the necessary conditions that have to be satisfied by a prophet. A prophet is a man who has more knowledge of the law ^e of the universe than other men. This is achieved by him when the isolation of the intellect from the other parts of the soul is perfected by virtue of his greater perfection and more intensive exercise of its activity, which is apprehension. Moreover, the greater the prophet the greater the miracle he performs. Thus, the Torah testifies that there is great difference between the miracles performed by Moses our teacher (may he rest in peace) and those performed by other [prophets].⁸ This indicates that the prophet is the agent who performs the miracle.

It would seem that this is the view of the sage Rabbi Abraham ibn Ezra. Because of this he thought that Moses had to strike [the rock] with

⁷Gersonides doesn't state the contrapositive, i.e., it is the Agent Intellect that is the agent of generation in the sub-lunar world. Evidently he assumes that the reader remembers this conclusion from Bk. 5, pt. 3, chaps. 4 and 13.

⁸Deuteronomy, 34:11.

his staff two times in order to bring forth water, since at the first stroke he was alone with his universal knowledge because of his anger. Thus, this sage said that the individual [i.e., Moses] remained an individual [and did not apprehend the general plan of the universe]. For, when the prophet does not use his knowledge, his form [i.e., intellect] encompasses only its specific matter. This is the view of Abraham ibn Ezra.⁹

These are then the various arguments in behalf of these three alternative views on this topic. Yet there are arguments in refutation of them. First, it seems that it is not proper for God to be the proximate cause of these miracles. If He were, the activity of the Agent Intellect in the sublunar domain would be superior to that of God; for the activity of the Agent Intellect is continuously good *essentially*, whereas this kind of activity, i.e., the performance of miracles, is good only accidentally. But to maintain that the activity of the Agent Intellect in the sub-lunar domain be superior to that of God is utterly reprehensible. For example, the transformation of the staff into a snake is not good in itself [i.e., essentially]; it is good only in so far as those who witness it acquire strong faith. Similarly, when the prophet's hand became leprous, this was not good in itself; rather it was evil in itself, but good accidentally, i.e., it gave those who witnessed the miracle strong faith. [Second], if God were the agent, the activity of the Agent Intellect in this world would be superior, since the latter's activity is all-encompassing and continuous, whereas the activity of God would be infrequent and He would remain idle from the work attributed to Him [i.e., the performance of miracles] most of the time. This is utterly absurd. [Third], if this hypothesis were granted, it would be impossible for the communication [of the miracle] to reach the prophet via prophecy. For the agent of this communication is the Agent Intellect, as has been explained;¹⁰ and it is not possible for the Agent Intellect to have this knowledge if God is alleged to be the agent of miracles, as has been pointed out before. [Fourth], if God is alleged to be the agent of miracles, it would follow either that both will

¹⁰Gersonides, *The Wars of the Lord*, vol. 2, Bk. 2, chap. 3.

⁹In his *Communitary on Numbers 20:8 and 22:8* Abraham ibn Ezra expresses the view that an individual (*heleq*), especially the prophet, can under certain conditions perform a miracle; i.e., when a person has attained such a high level of cognition that he is conjoined with God (*hakol*, "the All"), and thus becomes one with "the All", he can change the laws of nature and perform miracles, just as the Author of the All can. In the tragic episode of the "waters of contention" the intimate tie, or conjunction, between God and Moses was broken because of the people's murmuring and Moses lost his concentration, turned away from his comprehension of the universal plan of reality and focussed upon the particular needs of the moment. In doing so he returned to a state of particularity and was not able at the first striking of the rock to bring forth the water. Thus, he had to hit it a second time, when he returned to his state of conjunction with God, or the plan of the All.

-478-

and knowledge would be generated in Him when He wants to generate the miracle that He performs; or that the generation of this miracle at the particular moment when it occurred was determined and ordered by His eternal will. The claim that will and knowledge can be generated in God is absurd, [since in God there can be no changes]. And if we claim that the generation of this miracle at the time when it occurred^f was determined and ordered by God's eternal will, as suggested by some of our Rabbis (of blessed memory) in such statements that miracles were made a condition of creation¹¹ or that they were created at twilight, i.e., after the creation in six days [but] just before the beginning of the Sabbath,¹² -- many absurdities inevitably ensue. (Let us examine these difficulties one by one.)

First, on this hypothesis there would be no need for a prophet in the generation of the miracle: the miracle would be generated at the [preordained] time without a prophet. But this is obviously wrong.

Second, this hypothesis entails the following alternatives. Either we say that God ordained according to His eternal will the generation of a particular miracle at a particular moment and according to^g a specific purpose for which it occurs; or, we say that God ordained the generation of this miracle at this time not for the specific goal for which it occurs but it just so happens that from this miracle this goal is achieved. Now the thesis that God should arrange the generation of these miracles at their appointed times for no advantage is obviously absurd, since on such an assumption God would act in vain. Moreover, it is difficult to understand how the extraordinary benefit that does occur can derive from these miracles by accident. But if we say that God ordains according to his eternal will the generation of the miracles at the particular time they occur for a specific purpose, then there are no genuine possibilities in nature. For example, if the parting of the Sea of Reeds had already been known to God as occurring at that time it did in order to drown the Egyptians and to bring about complete faith in God amongst Israel, the Egyptians would have then been necessitated in their pursuit of Israel to the sea and Israel would have been necessitated in their lack of complete faith in God. If these [events] were not necessary, this miracle could have occurred at the time God had determined without any benefits resulting; for the Egyptians would have been free not to go to that place, since this [act] would have been attributed to their own choice. Similarly, in the case of Israel: Israel could have had complete faith in God before this time. Accordingly, [if these events are all pre-determined], it is clear that there would be no real possibilities, which is absurd.¹³ Indeed, this

¹¹*Beresliff Rabbali*, V:5, cf. Commentary of Yefe Tóar, ad locum.

¹²Mishnah Avot, V:7.

¹³Gersonides raises here an important objection against this rabbinic view, which may have been the doctrine of Maimonides as well (*Guide*, II:29; *Commentary on Pirqei Avot*, V.6). Abravanel too criticizes to this argument (Abravanel, *Mifalot 'Elohim*, Book 10, chapter 3).

hypothesis also rules out the view that the Agent Intellect performs these miracles.

Finally, God is the law, order and rightness of the universe, and in this He [can be said to be] the agent of existent things. Accordingly, since it is obvious that the generation of miracles is something that is contrary to this law -- for its generation is not subject to definite [rules] but it is possible for a miracle to be generated from many things; for example, the miraculous generation of a snake could have taken place from many different things [not only from a staff] and similarly in the case of many other things in the sub-lunar world -- it is impossible that God be the agent of the generation [of miracles]; for it is impossible for this order [pertaining to miracles] to be included in the order of the sub-lunar world that is present in God's soul. ¹⁴This argument also rules out the doctrine that the agent of these miracles is the Agent Intellect. ¹⁵

It can also be proved that it is impossible for man to be the agent of miracles. First, if this were so, he would not receive prophetic communication [about the miracle]; rather this thing [i.e., the miracle] would be attributed [solely] to his will. [Second,] it is evident that man cannot be the agent, since he cannot have the complete knowledge of the law of the sub-lunar world that would enable him to be the agent. This was demonstrated in Book 1 of this treatise, such that the law [governing] even one species of living thing cannot be completely known by man. Hence, would that I know how he could be the agent [of miracles]! [Third, if this were the case I am puzzled why he would perform deeds that fall outside the law governing sub-lunar existents, which [law] is intelligible to him. For, since a man would perform them (if he were the agent of such things,) because his intellect is isolated in its cognitive ability from the other parts of his soul, and in this respect it is not attached ^h to matter, it is clearly impossible that it be through the generation of a volition in him -- which on this hypothesis is the cause of the generation of the miracle -- that we attribute the generation of the miracle to the human intellect in so far as it is attached to matter [which *ex hypotliesi* it isn't]; for it [i.e., the intellect] does not ⁱ act in this way [i.e., by being attached to matter]. ¹⁶

¹⁴If God represents the principle of order in the universe, since miracles are counter to this order, they are antithetical to the divine nature.

¹⁵The Agent Intellect too is the principle of order for sub-lunar phenomena.

¹⁶This has been a difficult passage to translate because of the ambiguity of reference of several words, especially in the word underlined below.



On the basis of Gersonides' earlier presentation of the position which asserts that man is the agent of miracles, I have taken the referent of וְתוֹרָה to be the generation of the miracle, although it might also be the generation of the will.

This position, which Gersonides attributes to Abraham ibn Ezra, claims that man is the agent of miracles by virtue of a volition that is generated in him. However, this theory also asserts that in order to bring about the miracle such a person must attain a level of intellectual perfection akin to the level of the Agent Intellect. The generation of a volition is on this view attributable to the persons being attached to matter. Gersonides now argues that such a

doctrine is incoherent. On the one hand, it asserts that a volition is the cause of the miracle and that volition involves matter; on the other hand, it claims that a necessary condition for the performance of the miracle is intellectual perfection, which in turn requires isolation from matter. But if the alleged agent of the miracle performs the event in a state of isolation from matter, how can a volition be the cause of the miracle?

In translating this passage I have benefitted from discussions with Professor Menahem Kellner of Haifa University. See his "Gersonides on Miracles, the Messiah and Resurrection", *Da'at 4* (1980), 23.

-480-

[Finally,] if man were the agent, it would be possible for his form to change itself -- which is utterly absurd. This [consequence] follows according to this hypothesis, as I shall now show. For if it is assumed that man has the power to change the nature of sub-lunar phenomena, because he is like a form to them, it would follow that he would have even greater power to change his own being, e.g., that he make himself into a snake. For he is more truly a form to his [own] specific [or proximate] matter^k than he is a form to any of these things, such that all these things would be related to him as specific matter.¹⁷ Now the claim that a form can change the essence of which it is the form is self-contradictory. For it is from the form that the essence of the thing, of which it is the form, is derived. Hence, the form cannot be conceived as destroying that of which it is the form. In short, to list all the absurdities that follow from the hypothesis that man is the agent of miracles would entail a large essay. Thus, we shall be brief and stop at this point, wherein it has been shown that this view is false.

Now that we have discussed the pros and cons for each of these views, let us now determine which of them^m is the true view. Our dis-

¹⁷If a man can directly change a stick of wood into a snake, then surely he should be able to change *himself* into a snake. For to be able to do the former is to have complete knowledge of wood and snakes, which means in the medieval Aristotelian scheme to possess and be identical with the forms of these substances. But then he should be able to make *himself* into a snake, since he is the proximate form of himself!

-481-

cussion of the counter-arguments to the claim that man is the agent of miracles has clearly demonstrated the falsity of this view. The argument in favor of this view to the effect that man has some knowledge of the law of the terrestrial world already has been refuted in our discussion of the arguments that refute the thesis that man is the agent of miracles.¹⁸ Similarly, the argument for man as the agent of miracles because it is a condition of a miracle that a prophet be present -- and the greater the level of the prophet the more marvelous is the miracle -- clearly does not entail that the prophet is the agent of miracles. All that this argument entails is that the prophet has some affect upon the occurrence of miracles. Not everything that is relevant to the occurrence of something is the actual agent of the occurrence. The material causeⁿ, [for example], plays a role in the generation of a thing, but it is not the agent of generation; rather it is the recipient [of some external activity]. Thus, the brain has some affect upon the sensory [functions] of the animal that possesses a brain; but it is not the cause of these sensations, as has been explained in the *Book of Animals*.¹⁹ Accordingly, it is necessary to determine the precise role man has in this activity without thereby [implying] that he is the [actual] agent. This shall be made clear later on.

Similarly, we claim that all or most of the arguments refuting the thesis that God is the agent of miracles^p are valid, as is evident from the very nature of these arguments. The analogy between these events and God's creation of the universe does not establish in every respect the claim that God is the proximate cause of miracles. For the latter are more akin^q to the generations made by the Agent Intellect than they are to the creation of the universe; for they are instances of the generation of particular items in the universe, i.e., from one existent thing to another, similar to the other generations performed by the Agent Intellect. [However,] the creation of the universe attributed to God is a universal generation, and it is from a non-existent to an existent.²⁰ The argument that God is the agent of miracles because He has ordered the law for existent things and that it is not proper for one of them to rule over His law except God, does not entail that God is the agent of miracles. For we claim that the occurrence of miracles is derived from the very *essence* of this law, which has [indeed] been ordered by God for existent things.²¹ Hence, communica-

¹⁸The second of the counter-arguments.

¹⁹Aristotle, *Parts of Animals II:7*, II:10, especially 656a 14-656b 7.

²⁰This phrase should not be construed as implying the doctrine of creation *ex nihilo*, which doctrine Gersonides refuted in part 1, chapters 17-18 of Book 6. What he means in this present context is that the creation of the whole world is a "universal generation" in that it is the creation of a whole natural system, or cosmos, from a state of formlessness. In so far as formlessness is the lowest level of being, it can be regarded as "virtual non-being".

²¹The last sentence is troublesome since it sounds like the theory of the Rabbis, which Gersonides criticized earlier in this chapter, However, later in this chapter Gersonides will effect a reconciliation by interpreting the rabbinic view in the light of his own theory.

tion about them to the prophet is possible by means of prophecy; for communication is possible only with respect to determinate and ordered things precisely because they are so determined and ordered, as has been demonstrated in Book 2.²² This dissipates the force of the argument against the claim that either God or the Agent Intellect is the agent of miracles because such events are exceptions to the law of the universe. On the other hand, that which is written [in Scripture] attributing the performance of miracles to God does not imply that He is the *proximate agent*. For all things that occur are attributed by Scripture to God, even things that derive from human choice, as it is said "because the Lord [hath said unto him]: Curse David".²³ This is indeed the case, since God is the principle of all things that happen, as has been demonstrated, although He is not the proximate cause of them.

We claim therefore that the arguments we have mentioned in behalf of the thesis that the Agent Intellect is the agent of miracles are indubitably sound, as is evident from the very nature of these arguments. The counter-argument that this cannot be true because miracles are contrary to the law of the universe has just been refuted. For it is evident that miracles are inherent in the very essence of the law of the universe, and accordingly the prophet can be informed about them^s. Nevertheless, the argument that maintains that the Agent Intellect cannot be the agent of these miracles either because of the generation of [new] knowledge or a [new] desire in the Agent Intellect or the denial of genuine possibility requires examination. Indeed, such an argument would rule out God too as the agent of miracles. And since there is no^t agent of them other than God or the Agent Intellect -- for it would be impossible to consider man as the agent, as we have shown; nor would it be possible to consider a separate intellect other than the Agent Intellect or God as the agent, since if this were possible, this intellect would be the Agent Intellect, as we have demonstrated earlier, (in addition^u to which if we were to attribute this activity to any

separate intellect whatever the same absurdity [as above] would result) -- it is therefore evident that something must be ^v wrong in this argument or that man is the agent [of these miracles]. Since the latter alternative has been proven false, the former alternative must be true. But what *is* wrong with this argument, would that I knew!

Now in Book 2 it was explained how a particular communication ^w or a particular act can result from a separate agent: it occurs from the aspect

²²Gersonides, *The Wars of the Lord*, vol. 2, Bk. 2, chaps. 1-2.

²³II Sanwel 16:10. Maimonides, *Guide II*:48.

-483-

of the recipient. ²⁴Moreover, in Book [4] on Providence it was explained that the Agent Intellect bestows more of its providential activity on those who come closer to its level of perfection; and in this way its providential activity upon individual men necessarily varies according to their respective closeness or distance from its level of perfection. Now it is evident that this providence, which is displayed amongst individual men according to their proximity to the Agent Intellect, displays a law and order, and the exact amount of providence bestowed upon an individual man [is not a function of] his being this particular man, but results from the fact that he is *a* man having this particular degree of proximity to the Agent Intellect. Hence, since it is obvious that miracles are the expressions of providence, it is evident that miracles derive from the Agent Intellect in this way without any [new] knowledge or desire occurring in the Agent Intellect. Moreover, the occurrence of miracles is not necessitated, since human choice can subvert this law, as is the case with the other things that are ordered by the Agent Intellect and the heavenly bodies, as we have explained in Books 2, 3, and 4. And just as God gave man free choice to compensate for the imperfections in the order determined by the heavenly bodies (as has been pointed out in Books 2 and 4), so too has God endowed the soul of the Agent Intellect with this order of providence for individual man to compensate for the imperfections in the order determined by the heavenly bodies. Herein lies the solution of the problem raised by this objection, as is evident.

Because of this the occurrence of miracles necessarily requires the presence of a prophet. The proximity that an individual has to the Agent Intellect does not seem to result in this amount of providence unless the intellect of that individual has reached the level of perfection that would enable him to become a prophet. Thus, the miracle is as great as the perfection of the prophet. We have therefore shown who the agent of miracles is and what the role of men is in this phenomenon. This was our intention in this chapter.

Now the statements [previously cited] of our Rabbis -- that the miracles were stipulated conditions of creation and that they were created just before the seventh day [literally, "at twilight"] -- actually agree with our view. It has been shown that there is a law and order for the occurrence of miracles and that this plan was necessarily arranged in the original act of creation. ²⁵Note the wisdom of the Rabbis in their saying that the miracles were created just before the seventh day of creation. For the generation involved in the first six days during which the world was created

²⁴Gersonides, *The Wars of the Lord*, vol. 2, Bk. 2, chap. 6.

²⁵This removes the third objection to this saying of the Rabbis.

was a *voluntary act*, whereas that which followed from this generation on the seventh day is a ^x*natural* process. It is well known that the term "twilight" refers to that time between two days in which there are parts of both days, and ^y it is not clear to us which part belongs to which day. Accordingly, by means of this statement the Rabbis implied that the creation of the miracles is intermediate between voluntary creation, from which the world was created, and natural generation, according to which the existence of the world proceeds after its original creation. Since there is in some sense a law and order for the generation of miracles, it is similar to natural generation. [But] since that which is generated in it is not generated from a determinate thing, as is the case ^z in natural generation, the generation of miracles is like voluntary creation. ²⁶ Moreover, since this kind of generation is not brought about by means of the movements of the heavenly bodies and the effects of their radiation, as is the case with natural processes, it is similar to the voluntary creation from which the universe was created; for that which is created by voluntary creation does not take place via the heavenly bodies and their movements. For this reason our Rabbis have said that the occurrence of a miracle does not require an intermediary; for this activity is not arranged [i.e., determined] by the heavenly bodies. Rather, it is arranged by the Intellect that emanates from the movers of the spheres [i.e., the Agent Intellect]. This is brought out in their saying "'I [God] have passed through the land of Egypt' and not an angel": ²⁷ this indicates that this plague was a miracle and not arranged by the heavenly bodies. Accordingly, our Rabbis have said with respect to these miracles brought about by the Agent Intellect according to individual providence that their keys have not been given over to an agent. As they said: "Three keys have not been entrusted to an intermediary [i.e., a heavenly body]; and they are: the key of birth, the key of rain, and the key of the resurrection". ²⁸ They were referring to the opening of the womb of a barren woman by

²⁶This removes the second of the objections to the saying of the Rabbis.

²⁷*Passover Haggadah; Mckhilta, VII.*

²⁸*B. Sanliedrin, 113a.* In this passage the Rabbis speak of three phenomena that are assigned to God's direct intervention: the "extraordinary" pregnancy of a hitherto barren woman, the rains and the resurrection of the dead. According to Rashis explanation of this passage, whereas most of God's "treasures" are guarded over and administered by specially appointed agents, e.g., the angels, some are under God's direct control; except here, Rashi claims, God decides to hand over resurrection of the dead to the prophet Elijah

What is especially striking about Gersonides' interpretation of this passage and the preceding one from the Passover Haggadah is that he replaces God with the Agent Intellect and the angels with the heavenly bodies. All sub-lunar phenomena that express general providence derive from the heavenly bodies. Since miracles are the expression of individual providence, they are ordered by the Agent Intellect. This entire theory is rejected by Abravanel, for whom God Himself is the agent of all miracles. [Abravanel, *Mif'alot Elohim X:8*, 990-91; *Commentary on Joshua*, Chap. 10.

virtue of individual providence [e.g., Sarah] and to the occurrence of rain because of individual providence [i.e., Elisha]. Indeed, since resurrection of the dead is one of the most extraordinary of all miracles, it is also quite clearly an expression of individual providence; for [its purpose] is to inculcate in all men at the time of resurrection perfect faith in God (may He be blessed). Just as the occurrence of miracles through Moses was for the purpose of instilling in the people of Israel perfect faith in God (may He be blessed) -- as it is said of Pharaoh "For I have hardened

his heart", and at the end of the passage it is said, "and ye shall know that I am the Lord" ²⁹ -- so the occurrence of this miracle [i.e., resurrection of the dead] at its time will be for the purpose of inculcating in *all* people perfect faith, as it is promised, "For then will I turn to the peoples a pure language that they may all call upon the named of the Lord, to serve Him with one consent". ³⁰

It is not an intention here to discuss the question of resurrection of the dead. Such an inquiry more properly belongs in our commentary in the Prophets and on the sayings of the Rabbis. ³¹ The course of our discussion, however, has led to this topic.

Our Rabbis (of blessed memory) also maintain that whatever happens in the terrestrial world is brought about by God through an intermediary, that He Himself is not the proximate agent. As they said: "God does nothing without first consulting his divine ministers". ³² This saying is to be understood as referring to whatever God has done *after* the six days of creation, not to the creation of the world itself; for the latter cannot be attributed to any intermediary, according to the believer in creation. This is quite obvious. ³³

²⁹Exodus, 10:1.

³⁰Zephaniah, 3:10.

³¹Neither of which has come down to us, if they were ever written.

³²*B. Sanhedrin*, 38b.

³³For a modern discussion of this general problem see the two essays by M.M. Kellner, "Gersonides and his Cultured Despisers: Arama and Abravanel", *Journal of Medieval and Renaissance Studies*, 6 (1976), 269-96; "Gersonides on Miracles, the Messiah and Resurrection", *Da'at*, 4(1980), 5-34.

CHAPTER XI

WITH respect to the question, *through whom* is the miracle performed [as distinct from the question, who is the agent, or cause, of the miracle], it is evident from the preceding discussion that it ought to be the prophet. If this were not the case, it would have been no proof for Israel that God (may He be blessed) appeared to Moses from the fact that he had performed miracles in their presence. It is proper that this be the case. For, since the performance of miracles is the expression of the highest level of providence possible and since this providence is a function of the proximity of the individual person to the level of the Agent Intellect, it is fitting that this sort of providence be granted to those individuals who are in fact the closest possible to the level of the Agent Intellect. However, this argument makes it difficult to account for those reports of our Rabbis (of blessed memory) who mention miracles performed by some wise men of their own times who were not prophets.

Indeed, it seems possible for miracles, as an expression of providence, to be performed by a wise man who is not a prophet if his wisdom is great. However, the miracle performed by the prophet concerns the case where there is an announcement of the miracle before its actual occurrence. For it is possible for a diviner to know many things that are arranged by the heavenly bodies, as we have explained in Book 2. Thus, it is not evident in every respect that he who forecasts the occurrence of such an event is indeed a prophet. But since miracles cannot be arranged by the heavenly bodies, as we have seen, he who ^a announces their occurrence beforehand is necessarily a prophet. ¹ Accordingly, Moses' prior announcement of the occurrence of miracles was proof to Israel that he was in fact a prophet. The prophetic accounts of miracles in which the prophet does have a role in their ^b occurrence do not entail ^c that they could not have occurred by means of a

wise man who was not a prophet. The accounts in the Prophetic books of this phenomenon [i.e., miracles performed by *prophets*] are [reported] not because of the unlikelihood of a wise man who is not a prophet existing at the required level of perfection such that this type of providence would be attached to him. Moreover, at that time prophets were in existence, and whatever of this

¹That is, the prophet differs from the wise man who performs miracles in so far as he can announce their occurrence beforehand, whereas the latter cannot. The prophet differs from the diviner who can make such announcements in so far as what the diviner predicts is not a miracle at all, since it is arranged, or determined, by the heavenly bodies.

-487-

phenomenon ^d occurred through them was sufficient. Nevertheless, it could have been possible that miracles were performed at that time [by wise men]; but it was not recorded in the prophetic books since the miracles recorded to have been performed by the prophets were sufficient. As this kind of providence is necessarily greater according to the level [of the perfection] of its recipient, the greater the level of the prophet the greater the miracle, as has been previously noted.

-488-

CHAPTER XII

IT is now appropriate to determine in which things miracles can occur and in which things they cannot.

Let us say at the outset that it is impossible for a miracle to occur such that its existence has a continuous duration ^a; i.e., the nature of some existent would suffer a miraculous change that would exist continually and uninterruptedly [in this new form]. If this were possible, it would ^b necessarily be [only] because that which derives from the heavenly bodies with respect to this thing is not essentially perfect; if it were essentially perfect, it would not be possible for it to suffer permanent change for the sake of improvement. It may happen to something which is essentially good that it would be better accidentally [i.e., non-essentially] at some time for its plan to change. But it would not be possible for it to be always accidentally better such that its plan would change [permanently]. For it is not possible for something accidental to endure in this manner; indeed, if it occurs at all, it is only of short duration. It is obvious that if we were to assume that that which derives [naturally] with respect to some phenomenon from the heavenly bodies is not good, we would be attributing imperfection to God (may He be blessed) in so far as He would have made nature in such a way that this imperfection would be continually enduring. It is therefore clear that the duration of miracles is necessarily not continuous.

The same is true with respect to the Torah. It is possible for something in it to change for a specific time because such a change is appropriate for that time. An example of this is the sacrifice offered by Elijah on Mount Carmel when sacrifices on altars outside of the Temple were prohibited, and other things of this sort. But it is not possible for a commandment of the Torah to be changed permanently; for the perfection and essential good in it are such that any change for the better cannot be permanent. If such changes occur, they do so for a short period and they are not essential changes. ¹

¹The first necessary condition for miracles laid down by Gersonides is that they do not last for a long period of time; i.e., they do not constitute a permanent rupture or change in the order of nature. By means of a miracle this order may be improved for the moment or a short period of time; but this "improvement" is only "accidental." Eventually, nature returns to its normal order.

Gersonides illustrates this general condition by a halakhic principle. A commandment of the Torah has everlasting validity; however, it may be annulled in an emergency (*lehora'at sha'ah*) for a specific reason and for a brief period of time. So with miracles; although the natural order is perfect, there are situations where "deviations" from this order are required, particularly for cases of individual providence. These departures from the natural order must be, however, of short duration. [See Gersonides' *Commentary on the Torah, Deuteronomy*, 227c, Sixth Lesson].

-489-

Herein lies an important difference between the miracles performed by one prophet and those performed by another prophet of a lower level of perfection. To the extent that the level of a prophet is higher the miracles he performs are more encompassing and longer in duration; it is as if the miracle approaches closer to the state of a natural phenomenon, since its non-essential good is more like an essential ^c [good]. This accounts for the great difference between the miracles performed by Moses (may he rest in peace) and those performed by the other prophets. The former are quite encompassing, as is evident in the miracles of the plagues that spread amongst all the Egyptians. Moreover, they lasted for a longer interval; as for example, the miracles of the Manna and the columns of fire and smoke, both of which lasted some forty years. Such miracles are unique to Moses our Teacher (may he rest in peace). The miracle of the handful of meal and the little oil in the cruse that did last for some time was performed by Elijah for one woman only, nor was that time as long as the duration of the Manna and the columns of fire and smoke. Moses' miracles were extraordinary because of the continual isolation of his intellect [from the other capacities of his soul] in his apprehension, such that the providence emanating from the Agent Intellect was able to reach to him continually. Since his knowledge approximated the perfection of the Agent Intellect to a greater extent than any other prophet, the miracles performed by him were more encompassing and extraordinary. By virtue of the degree of his continual unification with ²the Agent Intellect these miracles lasted for a long time. This is what the Torah [itself] reveals concerning the differences between the miracles performed by Moses and those of the other prophets.

Now it is also impossible for there to be miracles the conceptions of which are self-contradictory, e.g., that black can become white while [still] being black, such that opposites could be together at the same time in the same subject and in the same respect. As soon as we posit such a thing, the assumption is self-contradictory. For whatever is white is not black; hence, one and the same thing would [*ex hypothesi*] be black and

²The term *hitahadut* used here connotes unification. But it should be recalled that Gersonides rejects the possibility of complete unification of the human intellect with the Agent Intellect. Complete unification would involve complete identity in intellectual content. But this is impossible, since no man, including Moses, could know as much as the Agent Intellect (*The Wars of the Lord*, vol. 1, Bk. 1, chap. 12).

-490-

not-black at the same time. This is utterly absurd. For this reason it is evident that miracles cannot occur in the domain of pure mathematics as such. For example, it is impossible for a rectilinear triangle to be generated [via a miracle] whose interior angles are ^d less than the sum of two right angles. If this were possible, the angles of this triangle would be both equal and not equal to the sum of two right angles. This is absurd; for contradictories cannot coexist in one subject. ³

For the same reason it is impossible for miracles to occur in the domain of past events in so far as they are past. For example, on a certain day in the past no rain fell in Jerusalem; but afterwards [it is supposed] that rain did fall miraculously on that very day in the past in Jerusalem. [This is impossible.] For, since that day has already come to pass and no rain occurred, if it turns out afterwards that by way of a miracle it did rain on that day, two contradictory states of affairs would exist at that time: i.e., we would allege that it did rain and that it did not rain in that very same place. [But this is absurd]. Moreover, that which is to occur does so in the future, not in the past, as is obvious, and no further comment is required. ⁴

Furthermore, it is impossible for miracles to occur in the celestial domain. It has been demonstrated that the agent of miracles is the Agent Intellect, and it is not possible for the Agent Intellect to act upon the celestial bodies, since it is an effect of them. ⁵ Moreover, since miracles are the manifestations of goodness and providence (as has been pointed out), and since it is evident from our earlier discussion that any change in the order of the heavenly domain results in universal catastrophic destruction in the terrestrial domain, ⁶ it would be false to assert that something in the celestial domain could miraculously change.

Nor should anyone object to our argument by citing the case of the sun standing still for the benefit of Joshua. ⁷ That passage does not imply that the motion of the sun ceased. As proof of this consider the phrase "[and the sun] hastened not to go down about a whole day," i.e., it did not move quickly. Whatever is not moving cannot be described as "not

³The interior angles of a triangle are equal to the sum of two right angles, i.e., 180 degrees. This is a theorem of Euclid. Hence, it is self-contradictory to assert the opposite, at least within Euclidean geometry.

⁴These two examples illustrate that God's omnipotence is defined in terms of the *logically possible*: God cannot, even by way of miracle, do what is logically impossible, i.e., what is self-contradictory (cf. Maimonides, *Guide*, III:15. Aristotle, *Nicomachean Ethics* VI:2).

⁵In Bk. 5, pt. 3, chap. 13, Gersonides maintained that the Agent Intellect emanates from all the separate movers, or intelligences, of the heavenly bodies. Being the effect of these latter celestial forces, it cannot act upon the heavenly bodies.

⁶Gersonides, *The Wars of the Lord*, Bk. 6, pt. 1, chaps. 7-9.

⁷Joshua 10: 12-13 (cf. Gersonides, *Commentary on Joshua*, ad locum).

moving faster" ; rather, this description is applicable to something that is moving but [only] slowly. Accordingly, it is evident that the statement, "Sun, stand thou still upon Gibeon," does not imply that its movement ceased. Rather, it means that the sun continued to remain [in the horizon opposite them] at Gibeon, and [analogously] that the moon continued to remain [in the horizon opposite them] in the valley of Aijalon, until the vengeance of the people was completed against their enemies in the short time during which the sun appears opposite Gibeon and the moon opposite the valley of Aijalon. It is evident that although the sun and the moon were moving according to their usual motion, they were present in one place for an extended period of

time, e.g., at Gibeon and the valley of Aijalon. And this is what is said in the passage, "And the sun stood still and the moon stayed", i.e., the sun remained in Gibeon and the moon stayed in the valley of Aijalon until the vengeance of the people against their enemies was completed. This is exactly what Joshua asked for; however, Scripture in its usual fashion was brief on this point. ⁸

With respect to the passage, "And the sun stayed in the midst of the heaven and hastened not to go down about a whole day", the meaning is as follows. In astronomy it is well known ^g that when the sun or any heavenly body is "in the midst of the heavens", its descent is not clearly discernible for approximately a half-hour. Rather, its highest altitude is nearly uniform [i.e., the same] from about a half-hour before noon until about an hour after noon. This is clearly seen when one observes the altitude with any of the instruments designed for this purpose, such as the astrolabe, etc. Now it is obvious that the sun is the cause of day-time. Until noon the activity and illumination of the sun is increasing; then day-time is complete; afterwards it gradually diminishes until its illumination disappears completely ^h. This [process] is cyclical. Consequently, the completion of day-time clearly occurs when the sun is in "the midst of the heaven" [i.e., at the highest point in the horizon]; for until then daylight and its influence is [continually] increasing in strength and toward completion, whereas afterwards it decreases. Thus, about evening it is said, "the day was far spent". ⁹ This indicates that the day rises and continues [in strength] until noon; hence, the day is obviously complete at noon.

⁸Consult Abravanel's criticism of Gersonides' interpretation of this episode (Abravanel, *Coninientary on Joshua*, ad locum and his treatise *Mifalot Elohim*, Bk. 10, chap. 9. S. Feldman, "'Sun Stand Still' -- A Philosophical Astronomical Midrash", *Proceedings of the Ninth World Jewish Congress of Jewish Studies*, (Jerusalem, 1986), 77-84. B. Goldstein, "Astronomical and Astrological Themes in the Philosophical Works of Levi ben Gerson", reprinted in his *Theory and Observation in Ancient and Medieval Astronomy*, chap. 23, 223-24.

⁹judges 19:11.

Now the miracle of Joshua consisted in the fact that he wanted the victory to be accomplished during the short interval in which the sun's descent is not observable because it is in "the midst of the heaven", [i.e., about noon]. As it is said, "And the sun stood still and the moon stayed, until the nation had avenged themselves of their enemies. Is this not written in the book of Jashar? And the sun *stayed* [my italics] in the midst of the heaven and hastened not to go down about a whole day. And there was no day like that before it or after it, that the Lord harkened to the voice of a man; for the Lord fought for Israel." ¹⁰ This means that the sun was not observed by Israel as departing from opposite Gibeon, nor the moon from opposite the valley of Aijalon until their vengeance had been completed. Afterwards the explanation for this is given, so that no one should think that the sun ceased moving; for it says that the sun was "in the midst of the heavens". This was the reason why the sun did not quicken in its descent, as is the case *every* day at the completion of daytime when the sun does not speed up in its descent. Accordingly, it says that there was never a day like that before it or after it, when God listened to a man and immediately caused such an extraordinary phenomenon in such a short period of time. Indeed, this was so, i.e., that the vengeance was accomplished in such a short interval, since God was fighting for Israel. With respect to the moon, however, no explanation is given how it was possible for it to stay opposite the valley of Aijalon all this time, because the valley of Aijalon covers, I believe, a wider stretch of land than does Gibeon, and thus the staying of the moon there could have been observable to some extent.

The Torah itself adds something to clarify and complete what we have explained of this matter when it distinguishes between the miracles performed by Moses and those performed by anyone else. ¹¹If the miracle performed by Joshua were such that the order of the movements of the heavenly bodies would have changed, this would be an infinitely greater miracle than any performed by Moses. This is quite evident. As this was a difficulty for some of our Rabbis because they believed that this miracle did indeed consist in a change in the order of the movements of the heavenly bodies, they maintained that something like this miracle had been actually performed by Moses. ¹²But if this were true, the Torah would obviously not fail to mention it, since it is a pivotal point upon which the whole belief in miracles rests. ¹³

¹⁰Joshua 10:13-14.

¹¹Deuteronomy 34:11.

¹²In *B. 'Avodah Zara 25a* and *Ta'anit 20a*, there is cited the view that for Moses too the sun was halted.

¹³One of the main purposes of miracles is to inculcate belief in God and His prophets. But if the Torah were to fail to mention the performer of a miracle, it would then defeat one of its purposes (cf. Gersonides' *Commentary on Joshua*, ad locum).

Another proof that this miracle did not consist in the cessation of motion of the sun and of the moon is that by its very nature a miracle cannot occur in vain, and if the sun had ceased moving at that time, no advantage would have accrued to Israel or to anyone else. For Israel had already accepted the belief in ¹prophecy; nor did any other nation turn to the belief in God because of this miracle. Nor did any prophet lead such nations [to God] because of this miracle by saying to them that they should believe in God and submit to his service, since He is the Lord of the universe, and that the proof of this is that He has caused the sun to stop moving. For if this had been the case, it would have been mentioned in the story of this miracle. It is clear, therefore, that it is impossible to interpret this miracle as occurring in the celestial domain. Rather, the miracle consisted in the victory of Israel over its enemies in a very short period of time, as we have explained; and the advantage accruing to Israel from this miracle was obvious.

It has, therefore, been demonstrated that the meaning of the sun's standing still in this place is not to be construed as referring to the cessation of the sun's motion. Accordingly, our Rabbis also have made this stipulation in their mentioning of the miracle of the sun's "standing still", its being in the middle of the firmament. They said: "' Should he [the false prophet] cause the sun to stand still in the middle of the firmament, thou must not hearken to him.' Rabbi Akiba said: 'God forbid that the Almighty should cause the sun to stand still in the firmament at the behest of those who transgressed His Will.' " ¹⁴If by the standing-still of the sun they meant the cessation of its motion, the phrase "in the middle of the firmament" would then be superfluous; for the miracle of standing-still [i.e., cessation of motion] could take place *anywhere* in the firmament. By saying "in the middle of the firmament" they wanted to point out that this "standing-still" consisted merely in the sun's being in the middle of the firmament; for at that place the sun can remain for a long time without being seen as either descending or ascending, as has been explained. In this passage the Rabbis implied that it is impossible that God will listen to someone who has transgressed the divine commandments even if he delimits a short ¹ period of time in which a tremendous success could be accomplished, as did Joshua.

Further confirming evidence for the fact that the sun did not cease moving altogether is given by the phrase "and it hastened not to go down". This sentence denies that there was any *perceivable*

quickness of the sun [at this time]; it does not deny that the sun had any motion at all. If the sun had no motion at all, the sentence should have denied absolutely

¹⁴B. *Sanhedrin* 90a. Gersonides' citation of this passage deviates a little from the original.

-494-

any motion of the sun, not merely its quickness. This is obvious.

If someone were to raise the question of the miracle of the shadow [moving backward] performed [by Isaiah] for Hezekiah -- which might be thought as entailing a change in the order of the movements of the sun -- we reply to him [as follows]. It is obvious that this miracle did not result from a change in the order of the motion of the sun. If it had, Scripture would not have attributed this [backward] movement to the shadow but rather to the sun; for the movement of the shadow is consequent upon the motion of the sun. Moreover, if this were true [i.e., that the sun changed its motion], it would not have been possible for Hezekiah to say "It is a light thing for the shadow to decline [forward] ten degrees". ¹⁵For it is not possible ^m for the order of the sun's motion to be upset with respect to quickness any more than it is possible for [its regular motion] to be upset by reversing its motion; the miracle is the same in both cases. The miraculous element in this event is as follows. In a receiving [body] of some thickness, which operates like a mirror, the [reflection] of a heavenly body can be seen. This is the explanation of haloes and the rainbow ⁿ, as has been demonstrated in the *Meteorologica*. ¹⁶Now when a cloud is under the sun, the sun is reflected in it. If this cloud moves quickly, it can move ^o the ray of the sun along with it and cause the ray to be seen not in its proper place; for the cloud will have moved for a while before this impression disappears from it. It is in this way that when a cloud passes under the sun you see the ray of the sun not in its proper place. This is the explanation of what happens with flowing water: a man sees his reflection duplicated. Because of its quick motion the water, in which ^p the image is reflected, flows by and the image disappears from it only after it is reflected ^q in another part of the water. [Now,] since Hezekiah had noticed the movement ^r of the cloud in a certain direction, he said that it would be easy for the shadow to incline 10 ^o in the direction of the motion of the cloud, because of the speed of that motion. But it would ^s have been a miracle if the shadow had gone *backward* 10 ^o in an opposite direction to that of the motion of the cloud. Thus, the miracle at that time consisted in the reversal of the cloud's motion from the direction it was ^t going at the moment, as fixed by the prophet. It is evident therefore that the miracle did not occur in the domain of everlasting phenomena [i.e., the heavenly domain]. ¹⁷

¹⁵II Kings 20:8-11.

¹⁶Aristotle, *Meteorologica* III:2.

¹⁷Gersonides, *Commentary on II Kings* 2:9-11. A cloud is a sub-lunar phenomenon, and thus its "normal" behavior can be changed, at least for a relatively short period of time. In his *Commentary on Kings* Gersonides explains how God brought about this change in the direction of the shadow. At that moment God created vapors that ascended in the direction of the sun and became clouds. In these vapors, or clouds, the sun's rays were reflected and moved along with the exceedingly rapid motion of these vapors, or clouds, in the reverse direction, producing a shadow of "10 ^o backwards".

-495-

It should be realized that some of later sages agree with the view expressed in this chapter. They said [concerning the verse], "But if the Lord make a new thing [and the earth open her mouth]" ¹⁸ : "If the mouth of Gehenna has already been created, 'tis well; if not, let the Lord create it." ¹⁹ This means that an opening in the earth occurs when a smoky vapor is generated in the core of the earth, resulting in a generation like fire; and the earth opens at that place when this generation has remained for a long time at that place, as has been explained in the *Meteorologica*. ²⁰ The fire comes forth at the place where the earth opens up. This phenomenon is called "*Gehinom*" in Hebrew, as is evident [in the phrase] "the valley of ben Hinom", [which is the name of a place] near Jerusalem. Some have objected: "Now isn't it written, "There is nothing new under the sun"? ²¹ Namely, it is impossible for nature to change its ways!" They replied: "Look, "[Moses prayed that] its mouth might be brought up [to the spot where Korah and his company were standing]." ²² That is, this miracle did not consist in the creation of an absolutely new thing; for an opening in the earth in the way just indicated can occur *naturally*. The novelty ^u in this occurrence [i.e., the opening of the earth and its swallowing-up of Korah and his company] consisted in the rapidity of this event; for according to the natural course of events this occurrence would occur only after a long time. This event is like other such miracles: the transformation, [for example], of the staff into a snake would in the regular course of nature require a very long interval of time [during which] the [matter of the] staff would acquire and lose various forms until it became transformed into a snake. Now the miracle consists in the transformation [into a snake] without [the matter of the staff having to assume all] the intermediary [forms] that it would ordinarily have to do in order for a snake to be generated by means of them ^v. From this discussion it is evident that the sages believed that whatever occurs miraculously must also be within the realm of natural possibility, [at least] over a long interval of time. ²³ Accordingly, since it is obvious that the order of movements

¹⁸Numbers 16:30, where Moses speaks of the punishment of Korah and his company.

¹⁹*B. Sanhedrin*, 110a.

²⁰Aristotle, *op.cit.*, II: 8, 336b 8-30.

²¹Ecclesiastes 1:9.

²²*B. Sanhedrin*, 110a.

²³Gersonides, *Commentary on the Torah*, Exodus, 55d -- 56a; Numbers, 188d, 191a. A similar explanation of the staffs turning into a snake was given by Al-Ghazali (Al-Ghazali, *The Incoherence of the Philosophers*, Concerning the Natural Sciences, First Question, selection translated by Arthur Hyman in *Philosophy in the Middle Ages*, ed., A. Hyman and J. Walsh (Indianapolis, 1983), 287).

-496-

within the domain of heavenly and [everlasting things] cannot be changed, there cannot be any miracles in this domain.

We have thus demarcated the domain within which miracles can occur and the realms wherein they cannot occur. In addition, it has been shown that all miracles are events in the sub-lunar world that occur in the future *qua* future; for in this sense they are possible [i.e., contingent]. ²⁴

²⁴Maimonides, *Guide*, III:15.

-497-

CHAPTER XIII

IT is now proper to examine the criteria for testing a prophet. There is a serious difficulty in this topic, especially in the light of what was laid down by Jeremiah the prophet [in his conflict] with Hananiah ben Azzur. ¹

It has already been demonstrated that a prophet is undoubtedly ^a tested by his forecasting the occurrence of miracles before they happen; for such knowledge is not attainable by anyone but a prophet. Accordingly, from what we have said in Book 2 it would appear that perfect communication ^b is attained only by the prophet. ² Therefore, a prophet is tested if all his words, which he told through prophecy, turn out to be true. It was in this way that Samuel was acknowledged by Israel as a prophet. For it is said: "And Samuel grew, and the Lord was with him and did let none of his words fall to the ground. And all Israel from Dan even to Beer-Sheba knew that Samuel was established to be a prophet of the Lord." ³ Scripture clearly points out that the reason for the people's knowing that Samuel was ^c a genuine prophet was that none of his predictions turned out to be false. The difference between these two tests is manifest; for the test concerning the forecasting of miracles is such that by *one* forecast alone the forecaster can be known to be a prophet. However, the second test is such that the forecaster is confirmed as a prophet only after many instances and if *all* his predictions, made through prophecy, are verified. For this reason the proof given by Moses our Teacher (may he rest in peace) that he was a prophet consisted in his forecasting of miracles; for this testis satisfied by merely one instance of a [true] forecast. ⁴

The point raised by Jeremiah, however, requires some consideration. He maintained that the prophet is tested by the promises of good things,

¹Jeremiah, 28:9 ff.

²Gersonides, *The Wars of the Lord*, vol. 2, Bk. 2, chap. 6, eighth problem, pp. 59-60; vol. 3, Bk. 6, pt. 2, chap. 11.

³I Samuel, 3:19-20.

⁴Since Moses had to convince the people of his divine mission quickly, his reliability was determined by the "shorter method". By the time of Samuel, however, the people had experienced the prophecies of Moses and Joshua and were instructed by Moses to be wary of false prophets (Deuteronomy, 18:20-22). Hence, the test of Samuel had to be stricter (*B. Shabbat*, 55a. Maimonides, *Mislineli Torali*, Yesoclei ha-Torah, chap. 10:4. Abravanel, *Mifalot 'Elohim*, Book X, chap.12).

not by promises of evils. For, if we were to say that the prophet is not tested by the promises of evils because God is gracious and repents of the evil when the recipient changes his condition so that divine providence attaches to him and [thus] the [ordained] evil departs ^d from him, what should we say about the promises of good things? Should we claim ^e that the good predicted by the prophet will occur to that person necessarily? If so, genuine contingency in nature will be greatly reduced. Moreover, we find an announced good that did not necessarily occur. For God promised Jacob our Father, "Behold, I am with thee and will keep thee withersoever thou goest". ⁵ Yet, in spite of this [promise] Jacob was fearful of Esau his brother. But if it had been necessary that the promise for good ^f be fulfilled, Jacob should not have been fearful.

Now it was already explained that the evil announced by a prophet is uttered for the purpose of preservation, so that [the predicted evil] will not eventuate. It is for this purpose that the communication is given to the prophet. Accordingly, it is possible that this promise will not be fulfilled; for the recipient can try to take measures so that this event will not occur to him or he

can improve his ways, and thus merit divine providence and be saved. On the other hand, when something good is ordained for a person, it is not possible for it not to occur. For choice has been given to man to rectify the evil prepared for him which derives from the order of the heavenly bodies, not to pervert the good that is derived from them. Man does not by nature have the choice to flee from the good [and] to reject the good promised by the prophet; rather, he has a natural propensity toward the pursuit of the good. It is therefore unlikely that something good⁵ be ordained for a person and it not occur. In this manner a test for a prophet can be achieved if [his prediction] doesn't turn out to be true, since then it is verified that he is not a prophet. For if this good was ordered by the heavenly bodies, it would be unlikely not to occur. However, if that good does occur, this does not imply that the forecaster [ha-magid] is a true prophet; for it is possible for true predictions to be made by a diviner or through dreams. It is clear from Jeremiah's statement that the test he specified [is to be understood] in the way we have mentioned, i.e., if that predicted good is not realized, it will be clear to the people of Israel that Hananiah is not a real prophet.⁶

It is important to realize that this good, which we have said is unlikely not to materialize, is the good derived from the heavenly bodies. However, the good deriving from individual providence has a condition

⁵Genesis, 28:15.

⁶Jeremiah's test then provides at best only a necessary but not a sufficient condition for determining a true prophet. In the next paragraph we shall see that this test is subject to a qualification.

in its promise; hence, it is not inevitable that it eventuate. For example, the Torah promises us many benefits by way of individual providence *if* we walk in its paths. It is obvious that if we do not follow its ways, these goods will depart; as the Torah says, "But if ye will not hearken unto Me, etc."⁷ Similarly, the prophet's promise to Israel was revocable [i.e., subject to the condition of obedience to God], as he said: "neither shall the children of wickedness afflict them [Israel] any more".⁸ This promise is necessarily an expression of individual providence^h; for it is not possible for this good to be realized continuously [merely] by virtue of the plan determined by the heavenly bodies. This is evident to anyone slightly familiar with judicial astrology; for it is impossible for some evil not to derive from the heavenly bodies at some time. Individual providence is indeed necessarily subject to a condition: it occurs only to those individuals who conjoin with the Agent Intellect such that this providence conjoins with them.⁹ Similarly, the promise [given to] Jacob was necessarily an expression of individual providence; for it was not possible for [his] preservation to have been achieved throughout all his journeys [merely] by virtue of the order determined by the heavenly bodies. It was for this reason that Jacob was fearful that perhaps he would be the cause of sin, and [accordingly] this individual providence would depart from him.

It should not be objected against us [that individual providence is not subject to any conditions] on the basis of the saying of our Rabbis (of blessed memory): "Every beneficial promise made by God is irrevocable even if it is conditional".¹⁰ This statement is [true] when the condition is not an essential condition, as is evident from their¹ explanation of the [following] episode concerning Moses. When God said to Moses, "Now, therefore let Me alone, that My wrath may wax hot against them, and that I may consume them; and I will make of thee a great nation",¹¹ we should not construe the phrase "Now therefore let Me alone" as a condition of this good promised [to Moses], such that if he were to pray for the people this good would depart from

him. It is not appropriate to maintain that the good deed [i.e., prayer] prevents the good promised by^j God to Moses from occurring. ¹² Rather, if Moses hadn't prayed for Israel, doubtlessly this would have been a sin on his part; just as in Samuel's

¹⁰ *B. Berachot*, 7a.

¹¹ Exodus, 32:10. The context is the incident of the Golden Calf.

¹² One cannot say that by praying for Israel Moses forfeited the divine promise that he would be the father of a great nation.

⁷ Leviticus, 26:14.

⁸ II Samuel, 7:10.

⁹ Gersonides, *The Wars of the Lord*, vol. 2, Bk. 4, chap. 4.

-500-

case it is said, "far be it from me that I should sin against the Lord in ceasing to pray for you". ¹³ Accordingly, this passage means merely that Moses should not try too hard to save them nor should he be fearful of the extinction of the people of Israel; for a great people shall come forth from him anyway. Thus, the good promised to him did not cease because Moses had prayed for the people. ¹⁴

Now Maimonides solves this difficulty, which we have mentioned concerning the testing of the prophet, [by focusing upon] the promise of a benefit which doesn't eventuate: this shows that the promised benefit is irrevocable. ¹⁵ With respect to Jacob's fear of Esau, [however], it would seem that the promised^k benefit is revocable, as Maimonides says in the beginning of his *Commentary on the Mishnah*. For a promise which the prophet is sent to announce to others is irrevocable; whereas a promise of a benefit for the prophet himself, which is not sent to others, may be revocable. ¹⁶ It is evident, however, that this is not a real explanation of this problem. The question still remains, why is the promised good revocable when it concerns [only] the prophet himself and why is it irrevocable when it concerns others? Moreover, there is a case of a promised good which is revealed to a prophet who is sent to others and yet it is not fulfilled! For it is said of Israel, "neither shall the children of wickedness afflict them anymore"; ¹⁷ but^l this was not fulfilled. Our Rabbis have given the reason for this [statement] as follows: "in the beginning [the

¹³ I Samuel, 12:23.

¹⁴ *B. Berachot*, 7a. In I Chronicles 23:15-177 it is reported that Moses' family prospered and multiplied.

¹⁵ In the Introduction to his *Commentary on the Mishnah*, Zer'aim Maimonides takes up the general question of testing the prophet. He gives special prominence to the conflict between Jeremiah and Hananiah, and extrapolates from this episode a general test: '...if the prophet promises that good things will occur at a specified time, but [instead] famine, drought and similar things occur, we then know that he is a false prophet...For when God promises good things to a nation through a prophet, it is impossible for Him not to do what will fulfill the prophet's announcement to the people. This is what the Rabbis have said in *Berachot 7a*...' [my translation]. In this passage Maimonides seems to believe that Jeremiah's test is an adequate criterion for testing the prophet. However, he will soon qualify it, as Gersonides' argument shows.

¹⁶ Maimonides, *Commentary on the Mishnah*, Zera'im. Introduction; *Mishneh Torah*, Hilkhot Yesodei Ha-Torah, 7:7, 10:4.

¹⁷ II Samuel, 7:10.

enemies of Israel will no longer] afflict Israel; in the end [they will no longer] destroy it". ¹⁸ Herein it is demonstrated how a prophet is tested.

¹⁸B. *Berachot*, 7b.

Gersonides' citation of this rabbinic interpretation of II Samuel 7:10 is incomplete, omitting the beginning and middle parts of the exegesis. In *B. Berachot* the Rabbis discuss the importance of a specific place set aside for prayer and cite this instance from II Samuel, where the building of the Temple is mentioned. Rav Huna then points out that in the parallel passage in I Chronicles, 17:9 a different verb is used: instead of the verb *le'anoto* ("afflict") in II Samuel, Chronicles uses the verb *lebaloto* (or in the Talmud and Gersonides *lekaloto*, both verbs signifying "to destroy"). To reconcile the two versions Rav Huna enunciates the concluding formula: "in the beginning [they shall not] afflict Israel and at the end [they shall not] destroy Israel".

In his *Commentary on Chronicles* Gersonides explicitly recognizes Rav Huna's problem, without mentioning, however, the Talmudic text. He resolves the discrepancy between the two verbs as follows: this promise to David was essentially conditioned upon Israel's obedience to God. As in the case of Jacob, the non-fulfillment of this condition would revoke the promise; its fulfillment would bring it about. Now, since Israel was not obedient, the promise was not fulfilled and Israel's enemies did eventually afflict it. Nevertheless, because of the original covenant made with the Patriarchs God's promise to preserve the children of Israel will be fulfilled in so far as Israel's enemies will not *destroy* God's people completely. Thus, for Gersonides divine promises of benefits are essentially conditioned upon obedience to God, a rule that he explicitly formulates in his *Commentary on the Torah, Genesis*:

"Thus, Jacob was afraid lest he was not worthy to [receive] this extraordinary providence and because of this the promise of this good would not eventuate. For, a promise of a benefit is irrevocable if there is no essential condition attached to it. However, if there is an essential condition attached to it, the promise is inoperative with the failure [to fulfill] the condition, as is the case with the blessings written in the Torah..."

(*Commentary on the Torah*, Parshat Vayishlah, 40d-41a).

Throughout Gersonides' treatment of this problem the importance of human freedom is evident. Not only in the case of prophetic predictions of evils but also of goods our behavior is relevant to the fulfillment of the prophets' promises. (On this point, I have profited from discussions with Professor J.D. Bleich of Yeshiva University and Professor M.M. Kellner of the University of Haifa).

CHAPTER XIV

IT is necessary that we solve a serious difficulty about prophecy and miracles that is suggested by some passages in the prophetic books.

With respect to prophecy there is the problem implicit in the story of Samuel that he prophesied to Saul after he had died. ¹ The difficulty is that it has been demonstrated in Book 2 that the

knowledge of particulars accrues to prophecy not from the Agent Intellect but from the prophet, in so far as his thoughts are pre-occupied with those particulars. Now, how is it possible for a prophet to receive information about a particular event after his death? For then his mind is not pre-occupied with the particulars of the world, since his corporeal soul has passed away.² Moreover, it is utterly impossible that after death such information could be imparted to someone else. This is obvious.

With respect to miracles an analogous difficulty can be raised concerning the dead man whom Elisha resurrected after his [own] death when others had placed this man in Elisha's grave.³ Now, it was appropriate for the occurrence of this miracle to have been brought about through a prophet; and we don't find anyone present there to whom this great miracle could be attributed except Elisha. But to say that he actually performed this miracle would seem to be quite bizarre; for the providence deriving from the Agent Intellect could not attach itself to him after death, since he has no need of it. Whatever good and perfection was possible for him had already happened to him.

The first difficulty can be easily disposed of. We do not admit that what Saul heard from Samuel was a prophecy. Rather it was a communication by some sort of divination. In divination the imagination needs to employ certain techniques in order to isolate itself so that it can receive the higher power [that gives it this communication]. Now a necromancer [*ha-'ov*] is a type of diviner; therefore his voice is heard as

¹I Samuel, 28.

²According to Gersonides, the prophet particularizes the general information received from the Agent Intellect by applying this information to the specific circumstances of his generation. This involves his use of sense-data acquired through his own sense-faculties. But when a person dies, his sense-faculties, or corporeal soul in general, are no longer operative. Thus, it is difficult to account for Samuel's ability after his death to prophesize to Saul about the particulars of the latter's life.

³II Kings, 13:20-21.

very low, as it is said "Your voice is lower than a ghost".⁴ This is why his voice is heard only by the inquirer, as our Rabbis (of blessed memory) have said about it.⁵ But if he^a had a true [prophetic communication from Samuel], the voice would have been heard by everyone who was present there, not only by the inquirer. This is obvious. This is the point implicit in Saul's request of the woman, "Divine unto me, I pray thee, by a ghost";⁶ for this is a way of bringing^b about divination in so far as by means of that technique the imagination is stimulated and the other mental faculties are put to sleep, so that the imagination is completely isolated from the other faculties.⁷

The second difficulty is more complicated. Towards its solution we suggest [the following]. Just as the providence deriving from the heavenly bodies is of two types -- the preservation of the individual and the preservation of the species -- so too the providence deriving from the attachment to the Agent Intellect is of two kinds -- preservation of that individual and preservation of the group that derives from him in such a way that the providence reaching the individual also^c affects that which derives from him after his death. Such was the case with the divine promise to Abraham concerning the divine providence which extended over his progeny; as it is said, "and also that nation, whom they shall serve, will I judge".⁸ God thereby informed Abraham of the wonders He providentially created in order to smite the Egyptians because of the

attachment [to God] exhibited by the chosen Patriarch. Now it is possible in this manner that the providence attached to Elisha was such that

⁴The manuscripts and printed editions of *The Wars of the Lord* give the citation:



, "your voice is lower than a ghost". Presumably this is an allusion to Isaiah 29:4, which reads:



, "your voice will come like a ghost's from the ground". The latter citation is given by Gersonides in his Commentary on I Samuel 28:8 (Maimonides, *Mishneh Torah Hilkhos Avodah Zarah*, chap. 6. Abravanel, *Commentary on Samuel*, ad locum). Although Gersonides may have erred in misquoting Isaiah 29:4, it is possible that he intentionally modified the biblical phrase in order to accentuate his point that Saul's experience was a form of divination, not prophecy. Necromancy, he suggests, is a "low" (*shafel*) form of extraordinary perception. Perhaps he was making a pun here (Alfred Ivry's suggestion).

⁵Perhaps Gersonides is referring to *B. Sanhedrin*, 65 1-b.

⁶I Samuel, 28:8.

⁷In his *Commentary on Samuel*, Gersonides also points out that not only did Saul not receive a prophecy from Samuel but he did not see anything. Whereas the woman had a vision but heard nothing, Saul heard something but saw nothing. This is true, Gersonides claims, because the woman qua necromancer was pre-occupied with producing a vision, and so she saw something; Saul on the other hand, was pre-occupied with receiving advice, and so he heard words. In each case no prophecy occurred; only an image, visual or auditory, produced by divination.

⁸Genesis, 15:14.

-504-

this miracle proceeded from it after his death in his honor. ⁹This is no more bizarre^d than the extension of providence to the preservation of [a person's] possessions. ¹⁰Or, it is possible that someone was present then who was worthy of performing this miracle, although he is not mentioned.

This is what seems to us to be the solutions of these difficult questions. We have now completed our investigation of the topics that we have set out to examine in this Book.

This book [Part 2 of Book 6] was completed on the seventh day of Shevat in the year 5089 (January 8, 1329).

May the Creator of the world be blessed and exalted, He Who has helped us in His great mercy and love, beyond all blessing and praise! Amen, Amen!

¹⁰That is, if the divine providence is attached to the posterity and possessions of a man after his death, it can be said to be attached to *him* after death.

⁹Since Elisha presumably attained immortality by virtue of his acquired intellect, the latter was attached to the Agent Intellect to some degree and hence worthy of divine providence. This state of beatitude "produced" the miracle of resurrecting the dead man.

APPENDIX GERSONIDES ON ASTROLOGY TZVI LANGERMANN INTRODUCTION

The chief aim of this essay is to present in some detail the main elements of Levi ben Gerson's astrology. A second major goal is to illustrate just how astrology fits into Levi's philosophical system. For Levi did not simply "believe" in astrology. Indeed, when examining Levi's thought in particular, we can appreciate that medieval astrology comprised far more than simple fortune telling. When its teachings were developed by thinkers of Levi's caliber, astrology was a comprehensive explanatory system and a powerful competitor in the fields of natural science and religious thought.

It seems that from a strictly scientific point of view (according to the medieval understanding of what science is supposed to be), Levi saw astrology's chief merit to be its ability to provide teleological explanations for the wide variety of stellar motions that are observed to take place. In the first three sections of this essay I discuss Levi's account of the astrological purpose of the stellar motions. I pay particular attention to Levi's method of reasoning, which seems to be quite "scientific" even in the modern sense of the term.

Within Levi's system of religious philosophy astrology features most prominently in connection with two issues: the question of the unity of the cosmos, which, in turn, is crucial for ascertaining the unity of God, and the issue of providence. These matters are discussed in the following two sections. Finally, I survey those few passages where Levi confronts the controversial nature of astrology.

It is clear that in this essay I have of necessity touched upon several other facets of Levi's system. As I have already suggested, Levi succeeded in integrating just about all of the sciences of his day into an original and satisfying synthesis. The reader must bear in mind that other, quite differing interpretations may be found in the secondary literature concerning Levi's stand on divine providence, human free will, and several other of the issues that shall be raised in the context of our discussion of his astrology.

EXPLANATORY POWER OF ASTROLOGY: TELEOLOGY

Medieval scientists were generally of the opinion that the ultimate goal of scientific inquiry is to furnish teleological explanations of the phenomena. To put it differently, a science can be said to be complete when it has told us *for what purpose* the object of inquiry exists. Within this context, Levi is clearly impressed by the explanatory power of astrology. It is clear from the three concluding chapters of *The Wars of the Lord* Book 5, part 2 (chapters 7-9) that in Levi's view, only astrology -specifically, Levi's astrological system -- can furnish satisfactory replies to the teleological problems that are raised by the heavenly phenomena.

It is well-known that during the Middle Ages, a sharp distinction between the ethereal, eternally moving and unchanging heavens and the ever-changing sublunar sphere was quite universally accepted. Moreover, even those thinkers who were openly opposed to astrology acknowledged some physical influence of the heavenly bodies on terrestrial physics. There was, first of all, the gross effect of the motion of the sphere in mixing up the terrestrial elements. The light or

radiation of the stars was also recognized to exert some sort of influence. There were also some specific actions that could not be denied; the most obvious of these is the sun's heat.

In *The Wars of the Lord*, Book 5, part 2, chapter 6, Levi demolishes the Aristotelian/Averroean claim that the cause of the sun's capacity for heating the earth is the sun's motion. In its stead Levi proposes that the sun's heating effect be attributed to its light or radiation which, by means of a "divine force," is linked to fire, one of the four sublunar elements. (We shall investigate the concept of "divine force" in more detail below). Now for the purpose of disproving Aristotle and establishing his own theory, Levi found the issue of the sun's heat very useful. However, I do not believe that it was in the first instance the unsolved problem of the sun's heat which motivated Levi to prefer an astrological scheme over a more strictly Aristotelian system. It seems to me that Levi seized upon the problem of the sun's heat mainly for tactical reasons, since that particular problem offered the strongest indication of the failure of Aristotle and Averroes. The real reason for his preference for astrology lies in the unmatched ability of astrology to provide teleological explanations.

In chapter seven Levi presents a list of twenty-seven queries concerning some of the peculiarities of the heavens, most especially, the varied and diverse motions of the planets. It seems to me that one basic question underlies the entire set of questions. If all that is required of the heavens is to communicate one general motion to the earth, as Maimonides among others maintains, why, then, are the motions of the stars so complicated? Why should there be seven planets with distinctive

-507-

motions in longitude and latitude? Is not all of this superfluous, a shocking violation of the principle of the economy of nature? It is Levi's view that astrology can offer a satisfactory solution to this very troublesome difficulty. Three key concepts provide the basis for Levi's answers to his queries: (1) *variety* (*ribbui hayahasim*, literally "increasing the number of [available] proportions"); (2) *cycles* (*tequfot*, literally "seasons"); (3) *equilibrium* (*shivvui*). Let us examine each of these concepts and its application.

The earth is populated by a variety of creatures, each with its own special needs; and each species is, by definition, composed of a spectrum of individuals who differ from one another. All of these together require for their maintenance a wide variety of "influences" in order to provide the different requirements of heat, moisture, and other necessities. In Levi's astrology, this is achieved by the maximization as it were of the possible mixtures of stellar radiation, which, we recall, is the instrument by means of which the stellar influences are conveyed. The more obvious motions of the planets and the slower precessional movement of the fixed stars together insure a great number of possible angles between the stellar bodies. This in turn produces a wide variety of mixtures of the stellar radiation, which, in turn, guarantees a sufficient variety of "influences" on terrestrial processes.

The second key concept is *tequfot*, i.e., cycles or seasons. The four seasons that make up the tropical solar year are taken by Levi as a paradigm for cyclic change and renewal throughout the natural world. Such regular celestial phenomena as the orbits of the planets and the moon's phases are also shown to be divided into four quarters which mirror, albeit on a different time scale, the seasons of the sun. Each planet receives from the sun the property of seasonality, but it applies this principle according to its own rhythms. Indeed, this participation of all the planets in the phenomenon of seasonality explains why there should exist at all in the Ptolemaic system a mathematical relationship between the motions of the planets and that of the sun. Strictly speaking, Ptolemy established for each planet its own set of earth-centered orbs, and there is no

reason *a priori* why the position of the sun should figure in any of the individual planetary models. From Levi's point of view, the astrological function of the four seasons, which is the regulation of the planetary influences over four quarters in order to guide earthly creatures through their respective cycles, not only explains this mathematical relationship, which would otherwise be an odd quirk; it also helps to tie the different celestial motions into one harmonious whole. As we shall see, the unity of the cosmos is an important tenet of Levi's philosophy.

The third concept is equilibrium or, to give the complete term, the maintenance of equilibrium (*shemirat shivvui*). The first word is itself

-508-

rather crucial, for *shemirah*, in Levi's vocabulary, is synonymous with general providence (*hashgahah kelalit*). It represents that form of providence that sees to it that the natural order is maintained, that no one of the four Empedoclean elements so dominate to the extent that it swallows up all of the others. It also takes care that each of the various creatures constantly receives its required sustenance.

AXIOMATIZED ASTROLOGY

Levi contributed to astrology six axioms -- in his words, "self-evident or nearly self-evident principles" -- which establish the explanatory framework for astrology. According to the medieval conception, each science must have its own set of fundamental principles. Levi clearly realized that if astrology is to live up to the role that he assigns to it, "the fruit of the natural sciences," it must meet the structural demands that are made of the sciences. It is also significant that these axioms are introduced towards the end of *The Wars of the Lord* Book 5., part 2, between the posing of the 27 queries in chapter 7 and their solution two chapters later. It is as if Levi wishes to indicate that only by means of his clearly formulated rules can these problems be solved. Let us succinctly restate the six axioms:

1. The actions of the stars differ from one another.
2. The action of a star varies with its position on the ecliptic.
3. The strength of the action of a star increases according to the length of time that it spends in each part of the ecliptic. The longer a star remains in one part of the ecliptic, the greater the strength of its action.
4. The action of a star varies according to its latitude.
5. The greater the radiation emitted by a star, the stronger its action.
6. The closer a star is to the earth, the stronger its action.

The enunciation of each of these axioms is followed by brief remarks concerning its rationale. Some of these comments yield useful insights into Levi's scientific reasoning. For example, the second axiom is really based on the observation that a planet's influence varies in the course of its orbit. But, Levi asks, perhaps this variation is due only to the planet's changing altitude (its height above the horizon) which, if we ignore for the moment the planet's latitude, depends on the declination of that part of the ecliptic in which the star is found. (It is tacitly assumed here that the altitude, that is, the angle at which the star's rays meet the earth at a given locality, is the really crucial factor in determining the strength of the star's influence). This question is solved by choosing two points -- in fact, the only two points -- whose declinations are equal: 0° Aries and 0°

-509-

Libra, the equinoxes. Levi asserts that the same planet exerts different influences at each of these two points. From this it follows that the longitude alone, or, to be more precise, the mixture of the planet's radiation with that of the fixed star(s) located in each part of the ecliptic, is itself an

independent factor in determining the planetary influence. Levi further indicates that the difference in influence at 0° Aries and 0° Libra is derived empirically. Levi's methodology is of particular interest. Faced with two variables, one of which (altitude) is unquestionably a factor, Levi isolates the set of conditions under which this factor (altitude) remains constant and then checks for any additional variation in the planetary influence. The procedure meets scientific standards, even if its application (and purported result) seems odd to the modern reader.

Also rather striking is Levi's justification of the third axiom. A law of terrestrial physics states that the strength of an action is proportional to its duration; thus fire heats more in two hours than it does in one. Without a word of explanation or apology Levi applies this law directly to the action of the heavenly bodies even though, as we have already noted, medieval cosmology postulates that the laws of terrestrial physics are not valid for the celestial realm.

Finally, we note that in the fifth axiom, Levi does not tell us how to measure the magnitude of a star's radiation. We learn how this is to be done from the explanation attached to the sixth axiom and also from the answer to the twentieth query. The magnitude of a star's radiation is determined by the ratio of the stellar disc to the entire spherical orb of the star. In the explanation of the sixth axiom Levi tells us that the star's strength increases as it approaches the earth, for when the star is closer, the disc/orb ratio increases. We learn from this that the crucial factor is thus the *apparent* size of the planet. Moreover, by orb (here: *galgal*) Levi has in mind the "instantaneous" orbit of the planet at a given distance from the earth, rather than a fixed sphere or spherical shell.

The disc/orb ratio also figures in Levi's metaphysics of the heavens (*The Wars of the Lord*, Book 5, part 3). Levi there assigns three rankings to the stars, according to their "nobility" or "honor" (*nikhbad*). The first ranking is by the number of stars in each orb (or system of orbs). Clearly the orb of the fixed stars is given first place; but how are the planetary orbs to be listed? Levi appeals to the disc/orb ratio, which yields the following: sun, moon, Venus, Jupiter, and so on "by this procedure."

SPECIFIC TELEOLOGICAL EXPLANATIONS

It is worthwhile to supplement these general remarks by describing in more detail some of Levi's answers to his own queries. The first query concerns the fact that all of the heavenly bodies participate in two of the

-510-

celestial motions, the daily motion and a slow motion. The latter may be the result of (a) the precession of the equinoxes, (b) an independent motion that Levi attributes to the planetary apogees, or (c) a combination of the two. The query simply asks: why is this so? In his answer Levi applies several of the astrological principles that he has developed. In effect, all terrestrial processes are cyclic; all natural processes have their own four seasons, though for some (e.g., mountain building) these may be very long. In addition, *all* of the stars must have at least a token share in *all* of these processes. We have already suggested that the unity of the cosmos implied by this remark is an important principle of Levi's philosophy. Hence all stars share in the daily and slow motions.

Precession serves also to vary the distances of the fixed stars from the equinoxes, and this change of position also affects the influence of the star. For example, the mixture of radiation resulting from the configuration Mars-Regulus will have varying properties as Regulus, in its precessional motion, changes its distance from the intersection of the ecliptic and the equator.

Noteworthy in particular are several instances where Levi rejects then-accepted astrological theories in order to offer in their stead an explanation that fits his own scheme. Critical thinking is applied with vigor -- but only to make room for Levi's own proposal, which seems to be tailor-made for the problem. One case involves the tenet of the astrologers that a star's influence weakens when it is retrograde. The star's apparent deceleration and change of direction, so it seemed, indicates a corresponding drop in influence. Levi argues that the opposite is the case. In accordance with his third axiom, the star's influence increases, the longer it dallies over one particular spot on the ecliptic. But, of course, astrologers have always claimed that theirs is an empirical science and, Levi admits, the evidence does seem to show the planet's influence is weaker during retrogradation. However, this observation has been misinterpreted. In fact, the planet's influence is stronger. However, retrogradation always occurs around opposition, at which time the planet's influence is strongly counteracted by that of the sun. Hence the planet's *net* influence is less, and it is the net influence which we encounter in our terrestrial observations. As a matter of fact, this scheme plays an important role in nature's system of checks and balances. The planet's influence increases just at that time (opposition) that it is at its greatest disadvantage vis-a-vis the sun. As a result, equilibrium is maintained.

We find another interesting teleological explanation in query 26, in the matter of the lunar *maria*, which Levi calls the "shadow" in the moon. *Prima facie* this phenomenon contradicts the supposed perfection of the celestial bodies and, like comets and meteors, would best be explained by an Aristotelian as an atmospheric (sublunar) event, rather than as an

-511-

inherent property of a heavenly body. However, Levi demolishes that suggestion by means of a series of objections, all of which center upon the unlikelihood that an atmospheric phenomenon would always maintain the same alignment with the moon, that is, would always darken the same portion of the lunar surface throughout the moon's orbit, wherever the earthly observer may be located, and despite the lunar parallax! As a matter of fact, many of these same objections could just have as easily been raised against the Aristotelian explanation of comets. Levi concludes that the dark patches on the moon are a lunar, not an atmospheric phenomenon; some areas of the lunar surface are less efficient than others in reflecting the sun's light.

The dark spot has an astrological purpose. The greater part of the dark area is found in the eastern half of the lunar disc, and only a small portion is found in the western half. Since the moon's influence is a function of the radiation that it reflects from the sun, and the influence exerted by the dark area is weaker than that of the bright area, it follows that the moon's influences in the first and third quarters of the lunar month are unequal. This produces variety. Moreover, most of the dark spot is found in the northern half of the lunar disc. Since the moon controls moistness, and most of earthly civilization lies in the northern hemisphere, the dark spot on the moon serves to weaken the activity of water in the more densely populated areas of the earth, thus preserving civilization from inundation.

UNITY OF THE COSMOS

One of the distinctive features of Levi's philosophy is the attempt to arrive at an integrated world-picture, such that the details of the investigations into the various branches of science and philosophy are all woven into one coherent and comprehensive system. Astrology plays an important role in this project, over and above its capacity to explain specific phenomena of the celestial and terrestrial worlds. For it is astrological theory alone that explains the *connection* between the two worlds, providing a link between these otherwise distinct and autonomous realms. The integration of the two realms into one cosmic system is not merely an intellectual

challenge or an aesthetic *desideratum*. It is in fact required on theological grounds, and for a number of reasons.

Perhaps the fullest explanation of the principle "that all existence is interconnected" is found in Levi's commentary to the Torah. Levi describes in cosmic metaphor the significance of the Tabernacle and all of its appurtenances. Regarding the table and the twelve loaves ("shewbread") which were always to be placed upon it, Levi writes: "This signifies a wondrous matter, one of the greatest cornerstones of [both]

-512-

speculative thinking and the Torah. Specifically, this lower existence is influenced by the world of the spheres in such a way that it [the heavens] maintains (*yàamid*) those existents that are in it [the lower, sublunar world] by means of increasing at one time one of the opposites, and at another time another of the opposites. In this way the composite beings that are here are preserved for the maximum length of time, as has been demonstrated in the natural sciences."

In keeping with his scientific temperament, Levi does not limit himself to mere generalities. He fills out his explanation with some of the specifics of the planetary motions, including some of the problematics and alternate possibilities connected with the motion in latitude. These need not concern us here. Levi's point is clear: the interconnectedness of heavens and earth, manifested in the details of astral maintenance (as understood by Levi), constitutes one of the pillars of religious belief.

In my opinion, Levi's choice of the table as the symbol for the unity of the cosmos is quite deliberate. Maimonides, Levi's most famous precursor in the tradition of Jewish rationalism, had proposed his own understanding of the temple and its rites, which may be summarized as follows. At the time of the exodus from Egypt the Jews were deeply imbued with many of the pagan notions to which they had become exposed during the Egyptian bondage and, therefore, they were in no position to comprehend, let alone to accept, a religion devoid of a temple and its ritual. In this general vein Maimonides set out to explain the commandments relating to animal sacrifice, the construction of the temple, and its furnishings. However, Maimonides could find no explanation for the table, as he confesses in *Guide of the Perplexed*, III, 45: "However, I know of no reason for the table and [the fact] that there should always be upon it the shewbread. Till now I have not found anything to which I can attribute it." This passage was surely known to Levi, who must also have been aware of Maimonides' forceful rejection of astrology. We thus may not be far off the mark if we detect in the passage cited strong if indirect criticism at Maimonides' position. It is only because you reject astrology, Levi is saying to his venerable predecessor, that you fail to see the significance of the table.

The linkage between the two components of the physical universe symbolized by the table is an indication of the unity of creation and, by inference, of the Creator. Levi makes this point explicitly near the end of the same commentary: "This signifies that all existence is interconnected and is one in number. For this reason, God necessarily is one in number. If the matter were not taken (*hunah*) to be so, by the same token it would necessarily follow that there is one principle (*hathalah*) for the lower existents and another principle for the heavenly bodies, just as

-513-

those who believe in two gods think." The unity of God is tied in logically with the unity of the cosmos.

Other theological issues that have some connection to astrology are discussed in *The Wars of the Lord* Book 5, part 3, chapter 13. Here somewhat different dualistic implications are seen to result from the denial of any interconnection between the celestial and terrestrial realms. Levi warns us here, as he does in his Torah commentary, that such a denial leads inevitably to the conclusion that "the god (*eloha*) who governs (*manhig*) the lower things is other than the god who directs the higher." Nevertheless, it emerges that the heresy he really has in mind here is not dualism, but rather the denial of the afterlife. Levi identifies this as the fatal error of the classic Talmudic heretic, Elisha ben Abuya: "He thought that the principle of the corruptible things must [itself] be corruptible... and this led him to think that for man there is no survival of the soul... ". That is to say, Elisha did not comprehend, or refused to acknowledge, the connection between the corruptible earth and the eternal heavens. He did not recognize the unity of creation and the important implication of that fact, namely that man, though earthly, may have some share in an incorruptible spiritual dimension. In a word, ignorance or denial of astrology, the science which establishes the unity of the cosmos, may lead ultimately to the denial of the afterlife. In a subtle way Levi, always considered one of the more extreme spokesmen of medieval rationalism, may be hinting that Aristotelianism itself, which is in fact characterized by a sharp demarcation between heavens and earth, and also by the rejection of astrology, may lead to apostasy.

This interconnection notwithstanding, the sublunar and celestial spheres still operate as two separate systems, each functioning according to its own law (*nimus*). In Levi's opinion both God and the Agent Intellect have perfect knowledge of the workings of the sublunar sphere. The relatively greater scrutability of that realm is no doubt related to its lower cosmological ranking. Its scrutability also eases the treatment of some theological issues, such as miracles (see below). By contrast, the law of the heavens is known to God alone. The mover of each sphere is cognizant of its own function, and the Agent Intellect has an imperfect knowledge of the collective functioning of the heavenly spheres, but only God knows their law fully.

The connection between the celestial and terrestrial realms is, in fact, the necessary causal connection that exists between their respective laws. Knowledge of their linkage is knowledge of "how the law of the lower existents necessarily follows (*yithayyev*) from that law [of the heavens]." This is the subject investigated by astrologers. Perfect knowledge of the connection belongs to God alone.

-514-

Another key concept of Levi's astrology is the "divine force." According to Levi, observations and experiments have shown conclusively that there exist specific linkages between the light or radiation of the stars (sunlight, moonlight, etc.) and the terrestrial qualities (hot, moist, etc.). The divine force is responsible for this connection. The notion of divine force was used by some of Levi's predecessors, often as a synonym for inexplicable force; but, as it seems to me, Levi has chosen to use the term in the way that he does because of its theological resonance. The implications of this choice of terminology go beyond the point that we have already made concerning the unity of the cosmos. It appears that Levi wishes by the use of this term to introduce an element of contingency into what otherwise looks to be a closed, deterministic system.

Miracles may serve as an example of the type of problem whose solution may be alleviated by such an element of contingency. Levi traces miracles to the agency of the Agent Intellect which, prompted by the prayer of a prophet and motivated as well by its own responsibility to safe keep the sublunar realm, changes the natural course of events within a specific context. In Levi's view, miracles do not so much involve a violation of the laws of nature as they do the manifestation of changes which are themselves inherently "natural", but whose processing has been greatly

accelerated by the Agent Intellect in response to a specific calling. For example, the particles of wood that make up a staff may, in the course of many years and hundreds of cycles of composition and decomposition, eventually reassemble into a serpent. When an observer notices that the wooden staff of a prophet has turned into a staff in an instant, in fact he is witnessing a natural process that has been compressed into an extremely short -- unnaturally short, miraculously short -- span of time.

We may note further that Levi explicitly rejects the idea that God Himself directly brings about miracles. Miracles are also expressly said *not* to be the results of stellar radiation, since the effectiveness of these rays -- that is, their linkage by the "divine force" with the terrestrial qualities -- has been temporarily (and locally) suspended. Moreover, miracles are said to come about in response to prayer and, one must assume, one prays to God alone. This conglomeration of assertions makes the understanding of miracles within Levi's system somewhat difficult; it seems that the contingency introduced by having the physical effect of the stars depend on the divine force may be of some help. God may suspend the divine force, that is, He breaks the deterministic causal chain that connects the stars to the earth. He thereby allows the Agent Intellect to take whatever action is necessary. Though Levi never spells

-515-

out this mechanism in full, it seems to be a reasonable inference from the material that we have just scanned.

ASTRAL PROVIDENCE

The main purpose of the astral influences is to safeguard the natural order. Levi calls this "general providence" (*hashgahah kelalit*) in order to distinguish it from the special providence that is given to those individuals who have earned a special measure of attention. More frequently the astral guidance is called "preservation" (*shemirah*). At creation God impressed upon the "causes" of the astral forces a desire (*hesheq*) to maintain the universe. The individual stars, by means of their radiation and through the intermediacy of the active intellect, are the instruments (*kelim*) of preservation.

A full and concise statement of astral preservation is given in *The Wars of the Lord*, Book 4, chapter 6: "...for by means of them [the arrangements ordered by the celestial bodies] is preserved this lower existence, which contains such goodness and perfection that human intellect cannot fully comprehend it. This is so because they preserve the opposite elements so that all composite [bodies] endure in the most perfect manner possible. They preserve the basic heat in each existent for the longest possible time that it can be preserved. So if it could be imagined that the actions of the celestial bodies on those things that are here be lifted for a short time, the goodness and perfection which is found in them would disappear and none of the living beings would remain alive. We have already found that their providence over man is greater than [their providence] over other [things], such that all of his [man's] actions are set in order by them. It was necessary that this providence be attached to him more than it is attached to the other things that are here on account of the fineness (*daqut*) of his matter...".

Three components of the sublunar realm whose maintenance is the responsibility of the celestial bodies are named here. (1) Composite bodies. These are made up of elements of opposing qualities (e.g., hot and cold). The proper balance between them must be maintained, and the mutual destruction or the overwhelming of one element by another avoided. (2) The basic heat that, according to medieval biology, is necessary for life. (3) Man. Now man, as a composite and living being, already falls under the first two categories. Levi, however, wishes to emphasize

man's special dependence upon astral providence, a dependence that results from man's complexity and delicacy. Aristotle, in a passage from *De Animalibus* that is quoted by Levi, asserted that the higher the life form, the greater the number of limbs possessed by that creature. Levi

-516-

regards that rule to be an illustration of general providence, and from it he infers that nature takes extra care to safeguard the higher forms of life. Thus the astral forces exert an especially close control over man.

Of particular interest is Levi's explicit remark that man's thoughts as well as his physical characteristics are governed by the stars: "...so that his [man's] actions and thoughts are all ordered from them [the heavenly bodies]." Now it is an ancient debate among astrologers whether or not the stars influence mental as well as physical functions. This debate is interesting from a strictly philosophical point of view, especially as it echoes certain aspects of what has come to be called the mind/body problem. It seems clear that from a religious perspective, the notions that the stars influence human thought would be particularly objectionable. Indeed, that very notion seems to lie at the heart of Maimonides' repudiation of astrology. It is true that Levi does derive some advantage from his position on this matter with regard to his theories of prophecy and fortune telling. Since the thoughts of a given individual are contained in the stellar configuration, they can be transmitted to, or intercepted by, someone else. Thus a prophet or seer can read minds. On the other hand, Levi staunchly upholds the idea of free will, whose most important task, it would seem, is to allow the individual control over his own thoughts. This dilemma may be resolved only by a close examination of Levi's psychology, a project that lies beyond the purview of this essay.

Astral providence extends to human societies also. For example, the stars insure that the requisite number of individuals will "prefer" to join each of the professions, so that the needs of society as a whole may be met. The heavenly bodies also take care that man discover those remedies that he requires. Sometimes an appropriate clue will appear to a physician in a dream, while at other times the sick person himself will intuitively know which herb to employ. Levi records several specific instances of such events. He asserts that he himself knew a woman who used to cure hip ailments by means of a certain herb. She in turn learned of the remedy by observing a woman suffering from exactly the same ailment who, upon entering a garden, was seized by a great desire for a certain herb that was growing there and which she herself did not recognize. The woman instinctively placed the herb upon her hip and was cured. Levi regards this and similar incidents as empirical evidence for his theory.

POLEMICS

One gets no sense from Levi's writings that astrology is at all a controversial subject. Yet Levi must have been aware of Maimonides' outspoken condemnation of astrology, to give just one example. Now

-517-

Maimonides does ascribe to the heavenly bodies some physical action upon terrestrial beings, perhaps considerably more than one might have expected. Nevertheless, in my view it would be a serious mistake to assert that Levi's own brand of astrology falls within the bounds of, or is a mere elaboration of, the type of physical explanations that Maimonides allows. For beyond the clear disagreements between these two thinkers on matters of detail, especially the critical

question of the stars' capacity for influencing human thought, we must not forget that both individuals addressed themselves to the readily identifiable *discipline* of astrology (*mishpatei hakokhavim*). Astrology as it was known to him was unambiguously endorsed by Levi, just as it was unequivocally rejected by Maimonides. This stark contrast must never be obscured by whatever points of similarity we may discover in the thoughts of these two individuals.

The most probable explanation for the absence of any defense of astrology on Levi's part seems to lie in the fact that in his intellectual milieu, astrology was quite universally accepted, and Levi felt no particular pressure to justify his own acceptance. Nonetheless, in a number of scattered remarks he does take up some themes which relate to the medieval debate over the validity of astrology and, it seems to me, some of these efforts were aimed directly at Maimonides.

Perhaps the most striking indication of the confidence that Levi had in astrology is contained in a brief statement found in *The Wars of the Lord* Book 1, chapter 12. One of the recurrent themes of the medieval debate was the inaccuracy of a significant proportion of astrological predictions. Opponents saw in this clear proof of the fallacy of astrology; the few correct predictions could be safely dismissed as lucky guesses. Astrologers, on the other hand, felt that their low success rate indicated only the extreme technical difficulty of their art, whose goal of correlating all of the heavenly motions to the erratic behavior of terrestrial creatures was so ambitious that millennia of observations coupled with a constant refinement of technique would be necessary in order to boost the success rate; and, in any event, unerring accuracy was an unattainable goal.

Levi is aware that astrological predictions are often inaccurate. For him, however, this is not indicative of any fundamental problem that besets the art. Quite the contrary; because Levi is so sure that astrology is theoretically sound, the very inaccuracy of astrological prediction furnishes an important *datum* for another major issue, i.e., the limits of human knowledge. Levi writes, "And, in general, it is impossible that man know the truth regarding their arrangement. This is clear from what is found in the science of astrology, which is many times found to be mistaken." Fully stated, Levi's argument runs as follows. The Agent Intellect has complete knowledge of the combined effect of the stars on the lower

-518-

world. Man, who must rely upon his senses for his knowledge, cannot attain a full understanding even of the sublunar world: witness the repeated failures of the astrologers in their forecasts. *A fortiori*, man cannot know the underlying Truth or even the higher causes, knowledge of which is beyond the ability of the Agent Intellect as well.

The practical difficulties involved in the development of a more successful astrology are discussed at some length in *The Wars of the Lord* Book 2, chapter 2, and again in *The Wars of the Lord* Book 5, part 2, chapter 1. We must here recall that Levi, like Ptolemy before him, regards astrology to be an empirical science. According to this somewhat idealized conception, astrologers record over the years those stellar configurations that have been observed to accompany terrestrial events. The accuracy of astrology will depend in large measure upon the size and reliability of the data base that has been built up over the generations. Several problems combine to make the execution of this program rather difficult. The planets are distant in both space and in substance -- that is, their intrinsic material and formal difference from terrestrial (especially human) phenomena makes it all the more difficult to attain knowledge about them. In addition, we can observe only the *combined* effect of the stars, and it is exceedingly difficult to isolate the specific influences of each star. Moreover, exactly the same configuration will recur only after a very long period of time. Finally, humans possess free will, and the exercise of free will introduces a random element which confuses the data that is presented to the astrologer. In

fact, all these ideas were raised as objections to the validity of astrology during the course of medieval debate.

-519-

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INDEX OF NAMES

In this index I have not included the names of Aristotle, Charles Touati, and Harry Wolfson. Gersonides refers explicitly or implicitly to Aristotle throughout *The Wars of the Lord*: hence, a list of all these references would be pointless as well as almost endless. Since I have learned much from the studies of Charles Touati, and Harry Wolfson, I have not cited in this index specific references to these great scholars. Touati's *La pensée philosophique et théologique de Gersonide* is the most important scholarly work on Gersonides, and Wolfson's many studies are invaluable to the student and historian of medieval philosophy.

Abraham bar Hiyya, **3** : [431](#) n.4

Abraham ibn Daud, **2** : [98](#) n.15, [118](#).7, [131](#) n.35, [183](#) nn.7-8. **3** : [285](#) n.32

Abraham ibn Ezra, **1** : [5](#), [14](#). **2** : [136](#), [155](#) n.2, [213](#) n.2, [214](#). **3** : [201](#) n.31, [478](#) n.9, [481](#) n.16

Abravanel, Isaac, **1** : [12](#), [45](#) - [46](#). **3** : [207](#) n.53, [435](#) nn.7, [9](#), [480](#) n.13, [485](#) n.28, [492](#) n.8

Abravanel, Judah, **1** : [45](#)

Albalag, Isaac, **1** : [117](#) n.21. **3** : [303](#) n.2

Albo, Joseph, **2** : [159](#) n.6

Alexander of Aphrodisias, **1** : [72](#) - [81](#), [109](#) - [129](#), [170](#) **2** : [94](#) n.6, [96](#) n.11, [131](#) n.35, [141](#)

Altmann, Alexander, **1** : [29](#) n.69, [171](#) n.2. **2** : [7](#) n.6, [21](#) n.38, [47](#) n.16, [59](#) n.22. **3** : [175](#) n.14

Aquinas, Thomas, **1** : [47](#) - [49](#)

on creation, **3** : [200](#) n.28, [294](#) n.48, [344](#) n.19, [354](#) n.9, [368](#) n.1, [377](#) n.18, [446](#) n.1

on destruction of the universe, **3** : [319](#) n.3

on divine attributes, **2** : [108](#) n.1. **3** : [182](#) n.28

on divine commandments, **2** : [239](#) n.23

on God, **3** : [18](#) n.35, [115](#) n.50

on the human intellect, **1** : [40](#), [84](#) n.28, [111](#) n.2, [122](#) n.7, [150](#) n.10, [224](#) n.2. **3** : [82](#) n.4, [464](#) n.67
on the separate intellects (movers), **3** : [136](#) n.29, [146](#) n.14
Avempace (ibn Bajja or Abu Bakr), **3** : [106](#), [134](#)
Averroes (ibn Rushd), **1** : [5](#), [20](#), [24](#) - [30](#)
on creation, **3** : [221](#), [292](#) n.42, [309](#) n.3, [365](#) n.3, [366](#) n.1, [368](#) n.1, [375](#) - [376](#), [394](#) n.18
on divisibility, **2** : [125](#) - [131](#)
on dreams, divination and prophecy, **2** : [6](#) - [11](#), [32](#), [43](#) - [45](#), [51](#) - [52](#)
on the emergence of the earth, **3** : [305](#) - [307](#)
on generation and the need for a separate intellect, **3** : [81](#) - [84](#), [86](#), [88](#) n.11, [89](#) - [93](#), [97](#), [98](#) n.7, [99](#) - [109](#), [134](#)
on God and the divine attributes, **3** : [21](#) - [22](#), [113](#) - [121](#), [151](#) n.25, [151](#) n.27, [168](#) n.1, [168](#) n.2, [169](#) n.7, [170](#) n.9, [11](#), [172](#) n.1, [175](#) n.12, [175](#) n.14, [181](#) n.27, [240](#) n.5
on the heavenly bodies, **3** : [32](#) n.11, [12](#), [39](#) n.1, [39](#) n.3, [43](#) n.2, [166](#) n.1, [262](#) n.11, [304](#) n.3, [311](#) n.7, [313](#)
on the human intellect and the Agent Intellect, **1** : [73](#) - [80](#), [110](#), [115](#) n.16, [119](#) n.28, [128](#) - [129](#)

-569-

INDEX OF SUBJECTS AND TERMS

abstraction, **1** : [150](#), [160](#) - [161](#)
allegory, **2** : [216](#), [232](#)
'*anah* ("where," Aristotle's category $\rho\omicron\upsilon$ + $\acute{\alpha}$), **3** : [290](#)
angels, **2** : [227](#). **3** : [14](#), [209](#) - [210](#), [449](#), [461](#), [463](#)
apogee (See *merhaq rahoq*)
astrology, **1** : [24](#). **2** : [33](#) - [37](#), [51](#), [217](#). **3** : [30](#) - [31](#), [49](#), [61](#) - [62](#), [71](#) - [73](#),
appendix divination and dreams, **2** : [10](#) - [12](#), [46](#) - [47](#), [50](#), [64](#) - [65](#)
and providence, **2** : [169](#) - [170](#), [183](#) - [185](#), [196](#) - [198](#), [228](#) - [230](#)
astronomy, **1** : [21](#) - [24](#). **3** : [5](#) - [10](#), [13](#), [30](#) - [78](#), [139](#) - [146](#), [166](#) - [167](#), [192](#), appendix
atah ("instant"), **3** : [248](#), [358](#) - [364](#)
atomism, **2** : [124](#) - [130](#)
augmentability, **3** : [280](#) - [281](#)
Averroism, **1** : [40](#)
biblical exegesis, **1** : [11](#) - [16](#). **2** : appendix
biological generation (reproduction), **3** : [14](#) - [18](#), [29](#), [81](#) - [136](#)
body
celestial, nature of, **3** : [29](#) - [35](#), [39](#) - [47](#), [50](#), [61](#) - [62](#), [138](#) - [145](#), [162](#) - [163](#), [166](#) - [167](#)
creation of, **3** : [243](#) - [269](#), [449](#) - [450](#), [455](#) - [460](#)
human, **1** : [144](#)
"the body that doesn't preserve its shape," **3** : [36](#) - [38](#), [199](#), [202](#) - [203](#), [322](#) - [343](#), [433](#) - [435](#)
chance, **2** : [27](#) - [29](#), [168](#) - [173](#). **3** : [123](#), [239](#)
choice (free will), **1** : [32](#), [38](#) - [39](#). **2** : [10](#) - [11](#), [123](#), [226](#) - [230](#). **3** : [418](#) - [419](#)
cognition (*hassagah*)
divine, **1** : [38](#) - [39](#). **2** : [89](#) - [137](#). **3** : [112](#) - [122](#), [172](#) - [174](#)
heavenly spheres and their movers, **3** : [154](#) - [159](#), [164](#) - [165](#)
human, **1** : [80](#) - [84](#), [135](#) n.12, [172](#) - [178](#), [181](#) - [211](#), [212](#) - [217](#), [223](#) - [225](#)
composition (See *hwrkavah*)
commandments, **2** : [240](#) - [241](#)
communication
of contingent information, **2** : [30](#) - [37](#), [49](#) - [71](#)

of theoretical knowledge, **2** : [42](#) - [47](#)
 conception (*tziyyur*), **1** : [135](#) n.12, [186](#)
 intellectual (*tziyyur sikhli*), **1** : [180](#) - [181](#), [213](#). **3** : [138](#) - [139](#)
 material (*tziyyur hiyyulani*), **3** : [142](#) n.6
 conflict concerning philosophy, **1** : [33](#) - [34](#)
 conjunction with the Agent Intellect, **1** : [73](#) - [79](#), [113](#) n.8, [130](#) - [143](#), [170](#) - [182](#), [203](#) - [211](#),
[218](#) - [222](#)
 contingency, **2** : [30](#) - [37](#). **3** : [384](#) - [405](#)
 continuous magnitude (*kamut medubbeqet*), **2** : [95](#), [123](#) - [131](#). **3** : [139](#) n.3, [236](#) n.2
 convention (See *hanahah*)
 creation (*hiddush*), **1** : [37](#) - [38](#), [91](#) - [99](#). **3** : [193](#) - [211](#), [217](#) - [219](#)
 Aristotle's arguments against, **3** : [224](#) - [235](#), [351](#) - [383](#)
 biblical account of, **3** : [208](#) - [211](#), [428](#) - [469](#)
 ex aliquo (*hiddush miyyesh*), **2** : [149](#) - [150](#). **3** : [200](#) - [203](#), [221](#) - [222](#), [321](#) - [343](#), [406](#) -
[407](#), [428](#)
 ex nihilo (*hiddush me'ayyin*), **1** : [141](#) n.25. **3** : [194](#) - [195](#), [200](#) - [203](#), [222](#) - [224](#), [322](#) -
[331](#), [428](#)
 Gersonides' proofs of, **3** : [236](#) - [317](#), [351](#) - [409](#)
 John the Grammarian (Philoponus) on, **3** : [219](#), [223](#), [309](#) - [313](#)
 Maimonides on, **3** : [193](#) - [195](#), [203](#), [208](#) - [209](#), [219](#), [224](#), [235](#)
 Plato on, **3** : [200](#) - [203](#), [221](#) - [222](#), [321](#) - [324](#), [328](#) - [329](#)
 Stoics on, **3** : [219](#) - [221](#)
 darkness (*hoshekh*), **3** : [436](#) - [437](#)
 definition, **1** : [163](#), [186](#) - [188](#)
 determinism, **2** : [10](#) - [11](#), [28](#) - [31](#)

-574-

devarim peratiyyim 'efshariyyim ("possible particular things"), **2** : [89](#) n.1
devequt ("conjunction," See conjunction with the Agent Intellect) continuity and
 divisibility, **2** : [94](#) - [95](#), [123](#) - [131](#)
dibbur ("speech")
 murkav ("composite"), **3** : [430](#) n.1
 pashut ("simple"), **3** : [430](#) n.1
 dietary laws, **2** : [240](#) - [241](#)
dimayon ("imagination")
 tzurah dimyonit ("imaginative form"), **1** : [132](#) n.5, [145](#), [148](#) - [149](#), [160](#) - [161](#), [174](#) - [175](#),
[177](#) - [179](#), [204](#) - [207](#), [213](#), [215](#). **2** : [44](#) - [45](#)
 the role of imagination in dreams, divination and prophecy, **2** : [12](#) - [16](#), [20](#) - [22](#), [44](#) - [45](#),
[51](#) - [65](#), [68](#) - [71](#)
 difference (See *hevdel*)
 disposition (See *hakanah*)
 divination, **2** : [5](#) - [10](#), [13](#) - [14](#), [27](#) - [37](#), [59](#) - [67](#), [72](#) - [73](#), [194](#), [217](#) - [221](#). **3** : [503](#) - [505](#)
 divisibility, **2** : [94](#) - [95](#), [123](#) - [131](#). **3** : [280](#) - [282](#)
 dreaming, **2** : [6](#) - [8](#), [13](#) - [14](#), [27](#) - [37](#), [59](#) - [67](#)
 earth (See *'eretz*)
'efshari, *'efsharut* ("possible," possibility'), **2** : [30](#) n.1, [89](#) n.1. **3** : [274](#) n.15, [310](#) n.5, [372](#) -
[380](#), [387](#) n.4, [393](#) - [395](#), [402](#) - [403](#)
'ekhut ("quality")
 hipa'aluti ("passive quality"), **3**: [285](#) n.17
 elements, **3** : [148](#) - [150](#), [251](#)
 emanation, **3** : [195](#), [245](#) - [249](#)

emergence of the earth, **3** : [236](#) n.3, [303](#) - [308](#), [452](#) - [453](#)
'eret ("earth"), **3** : [432](#) - [435](#)
 eternity of the world, **3** : [219](#)
 arguments for **3** : [224](#) - [238](#)
 critique of these arguments, **3** : [351](#) - [383](#)
 Epicureans, **2** : [140](#)
'etzem, 'atzmut ("substance"), **1** : [195](#). **3** : [174](#) - [176](#), [285](#) n.16 *nit'atzem*, **1** : [117](#) n.21
 evil, **2** : [139](#), [146](#) - [151](#), [167](#) - [173](#), [180](#) - [205](#), [235](#) - [238](#)
 existential import, **1** : [193](#) - [194](#)
 finitude
 in the categories, **3** : [279](#) - [291](#)
 of time, **3** : [270](#) - [277](#), [291](#) - [298](#)
 firmament (*raqi'a*), **3** : [440](#)
 foreknowledge, **2** : [27](#) - [37](#), [75](#) - [78](#), [80](#) - [85](#), [89](#) - [106](#), [116](#) - [123](#), [132](#) - [137](#)
 form (See *tzurah*)
 generation (*hoveh, havayah*)
 and corruption, **3** : [384](#) - [405](#)
 natural, **1** : [151](#) - [157](#). **3** : [81](#) - [136](#), [368](#) - [372](#), [373](#) - [382](#), [406](#) - [407](#)
 voluntary, **3** : [255](#) - [257](#), [337](#) - [338](#), [342](#), [365](#), [372](#) - [374](#)
 universal vs. particular, **3** : [256](#) - [257](#), [307](#) - [308](#), [327](#) - [328](#), [340](#), [344](#), [365](#) - [367](#), [382](#)
 genus-species (See universal)
gevul
 hagbalah ("limit"), **2** : [129](#) n.29. **3** : [279](#) n.1
 nizigbal ("determinate"), **2** : [28](#) - [29](#)
gezerah ("proposition")
 setaniit ("indefinite"), **1** : [188](#) n.16
 kellalit ("universal"), **1** : [188](#) - [195](#)
 God
 activity of, **3** : [172](#) - [173](#), [182](#) - [183](#), 190- [191](#), [191](#)
 attributes of, **2** : [77](#) - [80](#), [107](#) - [115](#). **3** : [21](#) - [22](#), [172](#) - [184](#)
 existence of, **3** : [18](#) - [21](#), [138](#), [150](#) - [152](#), [175](#) - [182](#)
 as First Cause, **1** : [92](#). **3** : [158](#), [163](#) - [164](#), [167](#), [170](#) - [175](#), [185](#) - [188](#)
 the "hiding" of, **2** : [195](#) - [196](#)
 as Mover of a sphere, **3** : [168](#) - [171](#)

-575-

 His relationship to the other separate intellects, **3** : [22](#) - [25](#), [172](#) - [184](#)
hakanah ("disposition") **1** : [72](#), [109](#) n.3, [11](#) - [112](#)
 halakhic exegesis, **2** : [238](#) - [247](#)
hanahah ("convention"), **3** : [244](#) n.3
 happiness, human, **1** : [96](#). **2** : [182](#) n.5, [223](#) - [225](#)
harkavali ("composition")
 mizgit, **1** : [137](#) n.14
 shekhunit, **1** : [137](#) n.14
hassigah (See cognition)
 heat (*hom*)
 elemental (*hom yesodi*), **1** : [154](#) - [155](#). **2** : [62](#), [183](#). **3** : [96](#) n.3
 natural (*hom tiv'i*), **1** : [152](#) n.15. **3** : [97](#) n.3, [100](#), [105](#) - [107](#), [130](#); [135](#)
 proportioned (*hom meshu'ar*), **1** : [152](#) n.15. **3** : [83](#) n.10, [97](#) - [98](#), [100](#) - [101](#), [104](#), [136](#)
 soul (*hom nafshiyi*), **3** : [91](#) n.20, [97](#)
hekhrahi ("necessary"), **2** : [30](#) n.1, [89](#) n.1

hekrāh ha-homer ("the necessity of matter"), 2 : [149](#) - [150](#), [162](#), [163](#) n.11
heleq ("part"), 2 : [89](#) n.1
heqesh ("syllogism")
 hemshel (analogical), 1 : [203](#) n.49
 mitdabbeq (conjunctive), 1 : [131](#) n.1
 mithaleq (disjunctive), 1 : [131](#) n.1
 murkav (compound), 1 : [213](#) n.6
 tena'i (conditional), 1 : [131](#) n.1
hevdel ("difference"), 1 : [117](#) n.21, [190](#) n.22
hiddush (See creation)
hipa'alut, ("passivity," "affection," "passion"), 3 : [285](#) n.17, [290](#) n.38
hitztarfut ("relation," Aristotle's category *πρὸς ῥι*), 3 : [288](#) n.30
hizdamen, ("spontaneous"), 2 : [27](#) n.2
holiness, 2 : [241](#) - [242](#)
hom (See heat)
homer ("matter"), 2 : [149](#) - [150](#)
 and evil, 1 : [214](#). 2 : [149](#) - [151](#), [161](#) n.11, [165](#) - [168](#)
 primary, 1 : [144](#) - [145](#), [151](#), [157](#), [219](#) - [221](#). 3 : [36](#) - [38](#), [322](#), [330](#) - [344](#), [406](#) - [407](#)
 surplus, 3 : [332](#) - [334](#), [336](#) - [337](#)
hoshekh (See darkness)
hoveh, havayah (See generation)
imagination (See *dimayon*)
immortality, 1 : [39](#) - [40](#), [71](#) - [84](#), [109](#) - [110](#), [170](#) - [182](#) Gersonides' theory of, 1 : [212](#) - [217](#),
[223](#) - [225](#). 3 : [438](#) - [439](#)
'immūt ("verification," "true judgment"), 1 : [135](#) n.12, [186](#) n.11. 3 : [464](#) n.67
indestructibility of the universe, 3 : [203](#) - [206](#), [318](#) - [321](#), [368](#) - [380](#), [384](#) - [405](#)
inertia, 3 : [150](#) - [151](#), [313](#)
infinite
 and creation, 3 : [199](#) - [200](#), [279](#) - [302](#), [384](#) - [405](#)
 divisibility, 2 : [95](#) - [96](#), [123](#) - [131](#)
intellect (See *sekhel*)
'ish ("individual"), 2 : [89](#) n.1. (See particulars)
Job, 2 : [144](#) - [145](#), [160](#) - [165](#), [171](#) - [173](#), [205](#) - [206](#), [230](#) - [238](#)
Kalam, 2 : [96](#) n.11, [156](#). 3 : [218](#), [223](#)
kamut, ("quantity"), 3 : [253](#), [270](#), [279](#) - [298](#)
kazav'efshari ("possible falsehood"), 3 : [388](#) n.4
keli ("instrument"), 1 : [153](#) n.19
khellaluto ("throughout"), 2 : [123](#) n.20
koah, kohot ("power," "faculty," "potentiality," "capacity," "force")
 massigot ("cognitive"), 1 : [115](#) - [117](#), [124](#). 3 : [128](#) - [130](#)
 meqabbel ("receptive"), 2 : [58](#) n.19, [60](#) - [64](#), [68](#)
 metzayyer ("formative"),

-576-

1 : [153](#) - [155](#).

3 : [100](#) n.16

meyuḥad

("specific"), 3

: [229](#) n.32,

[386](#) n.3

mitpa`alot

("passive"), **1**

: [127](#) n.23

nafshiyyi

("soul"), **1** :

[152](#) - [154](#). **3** :

[83](#) n.9, [126](#),

[129](#) - [130](#)

qarov

("proximate"),

3 : [229](#) n.32,

[386](#) n.3

rahoq

("remote"), **3** :

[386](#) n.3

kokhav ("star," "heavenly body")

general nature of, **3** : [29](#) - [35](#), [39](#) - [49](#), appendix

meshortim ("auxiliary"), **2** : [70](#) n.5

motion of, **3** : [56](#) - [78](#), [138](#) - [152](#), [166](#) - [167](#)

qayyani ("fixed star"), **3** : [27](#) n.2

ratzim ("comets"), **3** : [49](#) n.4

language

conventionality of, **3** : [315](#) - [317](#), [357](#)

origin of, **3** : [315](#) - [317](#)

latitude (See *netiyah*)

"law, order and rightness", **1** : [146](#) - [148](#), [151](#) - [152](#). **3** : [118](#), [137](#), [156](#) - [159](#), [172](#) - [190](#)

light, **3** : [41](#) - [42](#), [50](#) - [55](#), [436](#) - [439](#), [447](#) - [449](#), [455](#) - [459](#)

lightness, **3** : [85](#) - [87](#), [102](#), [108](#)

limit (See *gevul*)

lo ("having," Aristotle's category ἔχειν, **3** : [289](#) n.37)

longitude (See *orekh*)

magic, **2** : [218](#)

maqom

"place" *meyuḥad* ("proper place"), **3** : [229](#) n.32, [387](#) n.3

qarov ("proximate place"), **3** : [229](#) n.32, [387](#) n.3

rahoq ("remote place"), **3** : [229](#) n.32, [387](#) n.3

"argument", **1** : [93](#) n.5

massigim ("accidental properties"), **1** : [109](#) n.1

matat ("when," Aristotle's category πότε) **3** : [288](#) n.28

mathematics, **1** : [199](#) - [200](#)

matter (See *homer*)

matzav, ("position," Aristotle's category κείσθαι, **3** : [290](#) n.39)

medubbaq (See continuous magnitude)

meqabbel ("receptacle"), **2** : [96](#) n.12

merḥaq raḥoq ("apogee"), **3** : [56](#) n.4, [59](#) n.21, [64](#)

meshush ("touch") **2** : [26](#) n.22

Messiah, **2** : [22](#) - [23](#), [224](#) - [225](#)

method, **1** : [97](#) - [104](#), [120](#)

metzi'ut ("existence"), **1** : [184](#) n.5

muskal ("existence in the intellect"), **1** : [184](#) n.5

mezeg ("mixture"), **1** : [158](#) n.33. **2** : [169](#) n.10

Milky Way, **3** : [13](#) - [14](#), [60](#), [75](#) - [78](#)

miqreh ("chance"), 2 : [27](#) n.2
 miracles, 3 : [411](#) - [420](#)
 agent of, 3 : [474](#) - [486](#)
 and creation 3 : [428](#) - [429](#)
 domain of, 3 : [489](#) - [496](#)
 and the prophet, 3 : [470](#) - [471](#), [477](#) - [482](#), [487](#) - [488](#)
 and providence, 3 : [470](#) - [471](#), [476](#), [484](#), [485](#)
 of sun's cessation of motion (Joshua 10), 3 : [492](#) - [495](#)
mispar medabber ("rational number"), 3 : [166](#) n.1, [287](#) n.24
mitdamei ha-ḥalaqim ("homogeneous parts"), 1 : [127](#) n.24
mithapekh ("reversible") 3 : [395](#) n.20
mofet ("proof"), 1 : [92](#) n.2
 muḥlat ("demonstrative syllogism or a priori inference"), 1 : [92](#) n.2
 re'ayah ("a posteriori proof or inference"), 1 : [92](#) n.2
 motion (See *tenūah*)

-577-

movers of the spheres, 1 : [157](#) - [159](#). 3 : [109](#), [138](#) - [152](#), [172](#) - [173](#), [183](#) - [191](#) First Mover, 3 : [98](#), [106](#), [109](#), [118](#)
 moon
 light of, 3 : [57](#), [55](#)
 motions of, 3 : [58](#) - [59](#), [64](#), [66](#) - [67](#), [73](#)
 shadows of, 3 : [60](#), [74](#) - [75](#)
muskal, muskalot ("objects of the intellect"), 1 : [66](#) n.4, [110](#) n.5, [172](#) - [211](#). 3 : [176](#) n.10
rishon ("first"), *sheni* ("second"), 1 : [95](#) n.10, [110](#) n.5, [174](#). 2 : [43](#) n.5
 necessity of matter, 2 : [149](#) - [151](#), [162](#) - [163](#) n.11, [167](#). 3 : [126](#) n.8
nekhoḥi, nekhoḥuto ("parallel," "even"), 1 : [199](#) n.40. 3 : [274](#) n.14 *nekhoḥei sheṭaḥim* ("parallel planes"), 3 : [243](#) n.2
netiyyah ("declination," "inclination": latitude of a planet), 3 : [58](#) n.14, [61](#), [68](#) - [69](#), [72](#) - [73](#)
nezorut ("retrogression of a planet"), 3 : [57](#) n.3, [67](#) - [69](#)
nikhrakh ("contiguous"), 3 : [139](#) n.3
nilveh ("consecutive," "succeeds"), 3 : [139](#) n.3
nitzutz ("ray"), 3 : [62](#), [164](#)
nose ("subject," "substratum"), 3 : [228](#) n.27
 bema'amar ("linguistic"), 2 : [112](#) n.12
 bemitzi'ut ("real"), 2 : [112](#) n.12
nitatzem (See *etzem*)
nitzḥi ("everlasting"), 1 : [170](#) n.1
 omniscience, 1 : [38](#) - [39](#). 2 : [75](#) - [85](#), [89](#) - [137](#), [226](#) - [230](#)
 omnipotence, 2 : [150](#)
orekh ("longitude" See *tenūah*)
 origin of the sciences, 3 : [314](#) - [317](#)
panim ("proper face of a planet"), 2 : [69](#) n.4, [195](#) n.32
 particulars (See *devarim peratiyyim'efshariyyim*) knowledge of (See omniscience)
 particularization argument 3 : [251](#) n.17, [252](#) - [257](#)
 place (See *maqom*)
 planets, 3 : [8](#) - [10](#), [27](#) n.2, [39](#) - [42](#), [56](#) - [73](#)
 pneuma, 3 : [100](#) n.17
pogeshet ("immediately next to"), 2 : [126](#) n.22
 possibility (See *'efsharut, 'efshari*)
 potentiality (See *koah*)

power (See *koah*)
priority (See *qedimah*)
prophecy
and Abraham, 2 : [221](#) - [222](#)
general theory of, 1 : [92](#) - [95](#). 2 : [6](#) - [23](#), [27](#) - [29](#), [49](#) - [65](#), [72](#) - [73](#), [219](#) - [224](#)
and miracles, 2 : [225](#)
and Moses, 2 : [16](#), [20](#) - [23](#), [56](#), [58](#), [72](#), [219](#), [222](#) - [226](#), [246](#)
testing of the prophet, 3 : [421](#) - [425](#), [498](#) - [502](#)
proposition (See *gezerah*)
providence
general, 1 : [41](#) - [42](#). 2 : [139](#) - [151](#), [180](#) - [185](#), [193](#) - [195](#), [235](#) - [236](#)
individual, 2 : [155](#), [174](#) - [179](#), [235](#) - [238](#). 3 : [413](#) - [415](#), [420](#), [423](#) - [424](#), [499](#) - [502](#), [504](#) - [505](#)
and Israel, 2 : [198](#) - [203](#)
and miracles, 2 : [202](#) - [205](#)
righteous, to the, 2 : [186](#) - [205](#)
prior and posterior predication, 2 : [107](#) - [115](#)
proof (See *mofet*)
qadam ("eternal"), 1 : [171](#) n.1
qedimah ("priority")
hayyulanit ("material priority"), 3 : [45](#) n.8, [446](#) n.3
qodem ("natural") *ihur* ("posterior"), 2 : [107](#) n.1

-578-

tivit ("natural priority"), 3 : [446](#) n.3
qinyan ("acquisition," Aristotle's category *ἡχείν*), 3 : [180](#) n.24, [289](#) n.37
qiyyum ("stability"), 3 : [245](#) n.5, [463](#) n.64
quantity (See *kamut*)
raqia (See *firmament*)
religious belief, 1 : [226](#)
reshit ("beginning"), 3 : [430](#) - [431](#), [446](#) - [447](#), [449](#)
retrogression of the planets (See *nezorut*)
reward and punishment (See *providence*)
rohav ("latitude," "diversity"), 3 : [253](#) n.2
roshei ha-teninim ("ascending nodes"), 3 : [56](#) n.5, [63](#) - [64](#)
ruah ("spirit," "wind"), 3 : [440](#) *ruhanit* ("spiritual"), 1 : [122](#) n.7
sacrifices, 2 : [245](#) - [247](#)
sekhel ("intellect")
the acquired intellect (*ha-sekhel ha-niqneh*), 1 : [72](#) - [84](#), [129](#) n.30, [171](#), [177](#), [180](#), [210](#) - [217](#), [223](#) - [224](#). 3 : [111](#), [463](#) - [464](#)
the Agent Intellect (*ha-sekhel ha-pòel*)
cause of miracles, 3 : [414](#) - [415](#), [418](#) - [420](#), [474](#) - [486](#), [490](#) - [491](#)
cause of natural generation, 3 : [80](#) - [110](#), [121](#) - [122](#), [123](#) - [136](#)
conjunction with, 1 : [39](#) - [40](#), [74](#) - [81](#), [131](#), [170](#) - [182](#), [218](#) - [223](#). 3 : [490](#) n.2
emanation of the, 3 : [185](#) - [191](#)
general nature of, 1 : [14](#), [16](#) - [18](#), [20](#) - [25](#), [72](#) - [84](#), [109](#) - [110](#), [131](#) - [143](#), [146](#) - [169](#), [184](#) - [185](#), [203](#) - [215](#)
cause of dreams, divination and prophecy, 2 : [11](#) - [16](#), [21](#), [38](#) - [41](#), [49](#) - [65](#)
providence, 2 : [174](#) - [178](#), [180](#) - [181](#)
the First Intellect, 3 : [112](#), [117](#), [137](#) - [138](#)
the material (human) intellect (*ha-sekhel ha-hiyyulani*), 1 : [71](#) - [81](#), [109](#) - [182](#). 2 :

[41](#), [57](#), [62](#). **3** : [116](#), [461](#)
 the potential intellect (*ha-sekhel bekoah*), **1** : [111](#) n.2
 separate intellects (*sekhalim nivdalim*, *sekhalim nifradim*), **1** : [113](#) - [114](#) n.11, [125](#) - [126](#), [178](#), [171](#). **3** : [14](#) - [25](#), [100](#), [105](#), [108](#) - [109](#), [138](#) - [145](#), [153](#) - [162](#), [164](#) - [165](#), [172](#), [185](#) - [191](#), [449](#), [454](#), [463](#), [465](#) - [466](#)
 sense-perception, **1** : [121](#) - [122](#), [136](#), [161](#), [174](#) - [177](#), [181](#), [183](#)
shalem, *shelemut* ("perfect," "perfection"), **1** : [208](#) n.54. **2** : [93](#) n.6. **3** : [258](#) n.1, [274](#) n.13
shem nigzar ("derived term"), **3** : [181](#) n.27
siddur muskal ("intelligible order," "rational order"), **1** : [82](#), [136](#), [157](#) n.30, [205](#) n.50, [214](#) - [215](#). **2** : [120](#) - [123](#). **3** : [109](#) - [111](#), [118](#) - [121](#)
 soul
 human, **1** : [71](#) - [84](#), [109](#) - [145](#), [170](#) - [182](#), [212](#) - [217](#). **3** : [81](#) - [95](#), [104](#) - [107](#), [125](#) - [130](#), [191](#)
 that emanates from the spheres (world-soul), **1** : [152](#) - [160](#). **3** : [89](#) n.12
 speech (See *dibbur*)
 sphere
 auxiliary (*meshartim*), **2** : [70](#) n.5. **3** : [160](#) - [162](#)
 diurnal, **3** : [43](#) - [47](#)
 do they have souls, **3** : [143](#) - [144](#).
 number of, **3** : [144](#) - [145](#)
 stars (See *kokhav*)
 Stoics, **2** : [140](#). **3** : [220](#) n.1, [270](#) n.1
 substance (See *etzem*)
 sufferings of the righteous, **2** : [201](#) - [205](#)
 sun
 heating of the air, **3** : [50](#) - [55](#),

-579-

motions

of, **3** :

[57](#) n.8,

[65](#) - [66](#)

 syllogism (See *heqesh*)

takhlit

 "form," **3** : [92](#) n.22

 "goal," "end," "purpose," **3** : [239](#) n.1 - [242](#)

 "limit," "extreme," "end," **3** : [285](#) n.18, [390](#) - [391](#) n.9, [396](#) n.22

ha-mer'haq ("the greatest distance"), **3** : [285](#) n.18

ha-shinui ("the end of the change"), **3** : [104](#) n.25

 teleology, natural, **3** : [11](#) - [18](#), [29](#) - [35](#), [39](#) - [47](#), [61](#) - [62](#), [196](#) - [198](#) and creation, **3** : [239](#) - [251](#), [258](#) - [269](#)

temidi ("eternal," "continuous"), **1** : [170](#) n.1

temunah limudit ("mathematical figure," "mathematical theorem"), **1** : [189](#) n.19

tem'iah ("motion")

 and creation, **3** : [299](#) - [302](#), [309](#) - [313](#), [368](#) - [380](#)

 disorderly, **3** : [322](#) - [324](#), [330](#) - [331](#)

 general theory of, **3** : [19](#) - [20](#), [104](#) - [105](#), [144](#) - [149](#), [309](#) - [313](#), [368](#) - [380](#)

ha-hilluf ("motion of anomaly"), **3** : [57](#) n.7, [63](#) - [73](#)

ha-mitaheret ("slow motion"), **3** : [46](#) n.10, [56](#) n.3, [63](#) - [70](#), [73](#)

ha-orekh ("longitudinal motion"), **3** : [56](#) n.6, [65](#) - [66](#), [73](#) - [74](#)

ha-yomit ("diurnal motion"), **3** : [56](#) n.2, [63](#) - [64](#).

tevà kollel (See universal)

time

and creation, **3** : [199](#) - [200](#), [270](#), [279](#) - [284](#), [351](#) - [357](#)

general nature of, **3** : [270](#) - [277](#)

finitude of past, **3** : [291](#) - [298](#)

tohu va-bohu ("formless and empty"), **3** : [437](#) - [440](#)

Torah

as perfect law, **3** : [432](#) - [433](#)

and philosophy, **1** : [95](#) - [98](#), [226](#). **2** : [136](#) - [137](#), [247](#)

transmigration of souls, **1** : [112](#) - [113](#) n.5

tziyyur (See conception)

tzurah, *tzurot* ("form")

elemental (*yesodit*), **1** : [144](#) - [145](#). **3** : [97](#) n.3

giver of **1** : [156](#) n.25

material, corporeal (*hayyulanit*), **1** : [113](#) - [115](#), [123](#) - [125](#), [156](#), [173](#) - [174](#), [179](#) - [180](#), [196](#), [203](#) - [204](#). **3** : [36](#) - [38](#), [85](#) - [86](#), [89](#) - [95](#), [129](#), [132](#) - [134](#), [136](#)

Platonic, **1** : [81](#), [156](#) n.25

separate (*nivdelet*, *nifredet*), **1** : [174](#), [177](#). **3** : [88](#) - [95](#), [97](#) - [99](#), [107](#), [109](#) - [113](#), [122](#) - [123](#), [192](#). (See also intellect, separate)

tempered (*mizgit*), **3** : [92](#) n.24, [131](#)

unicity

of God, **3** : [177](#) - [185](#)

of the universe, **3** : [348](#) - [353](#)

unity, **3** : [177](#) - [184](#)

universal (*tevàkollel*), **1** : [81](#) - [82](#), [116](#) n.18, [162](#) - [163](#), [172](#) - [173](#), [183](#) - [211](#)

vacuum, **3** : [328](#) - [330](#), [336](#), [348](#) n.1 - [350](#)

world-to-come, **1** : [222](#), [225](#). **2** : [197](#)

yahas ("relation," "similarity"), **2** : [114](#) n.15

yishtatfu ("cooperate"), **2** : [64](#) n.33